SCAG®
POWER EQUIPMENT

OPERATOR'S MANUAL

MODEL STC

THIS MANUAL CONTAINS THE OPERATING INSTRUCTIONS AND SAFETY INFORMATION FOR YOUR SCAG MOWER. READING THIS MANUAL CAN PROVIDE YOU WITH ASSISTANCE IN MAINTENANCE AND ADJUSTMENT PROCEDURES TO KEEP YOUR MOWER PERFORMING TO MAXIMUM EFFICIENCY. THE SPECIFIC MODELS THAT THIS BOOK COVERS ARE CONTAINED ON THE INSIDE COVER. BEFORE OPERATING YOUR MACHINE, PLEASE READ ALL THE INFORMATION ENCLOSED.

PART NUMBER 03105

WARNING:

FAILURE TO FOLLOW SAFE OPERATING PRACTICES MAY RESULT IN SERIOUS INJURY.

* Keep all shields in place, especially the grass discharge chute.
* Before performing any maintenance or service, stop the machine and remove the spark plug wire and ignition key.
* If a mechanism becomes clogged, stop the engine before cleaning.
* Keep hands, feet and clothing away from power-driven parts.
* Read this manual completely as well as other manuals that came with your mower.
* Keep others off the tractor (only one person at a time)

REMEMBER - YOUR MOWER IS ONLY AS SAFE AS THE OPERATOR!

Hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, maintenance, and storage of the equipment.

This manual covers the operating instructions and illustrated parts list for:

STC48A-19KA	**with a serial number of 7630001 to 7639999**
STC48A-20CV	**with a serial number of 7640001 to 7649999**
STC48A-21KA	**with a serial number of 7650001 to 7659999**
STC52A-21KA	**with a serial number of 7660001 to 7669999**
STC52A-23KA	**with a serial number of 7670001 to 7679999**
SMTC-48A	**with a serial number of 7680001 to 7689999**
SMTC-52A	**with a serial number of 7690001 to 7699999**

Always use the entire serial number listed on the serial number tag when referring to this product.

SCAG POWER EQUIPMENT

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GENERAL INFORMATION

1.1 INTRODUCTION

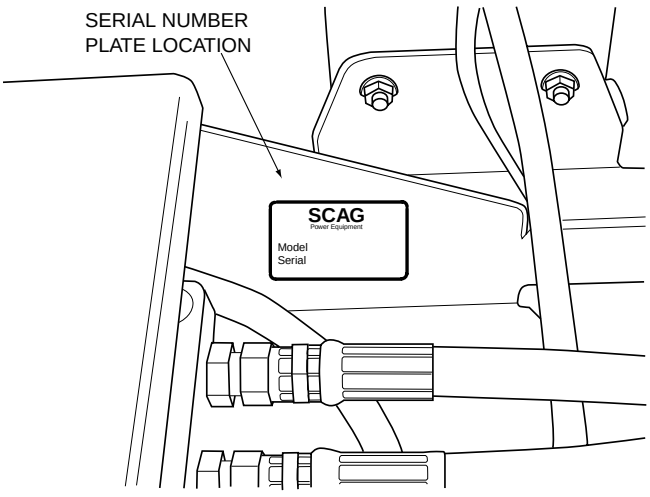
Your mower was built to the highest standards in the industry. However, the prolonged life and maximum efficiency of your mower depends on you following the operating, maintenance and adjustment instructions in this manual.

If additional information or service is needed, contact your Scag Power Equipment Dealer.

We encourage you to contact your dealer for repairs. All Scag dealers are informed of the latest methods to service this equipment and provide prompt and efficient service in the field or at their service shop. They carry a full line of Scag service parts.

USE OF OTHER THAN ORIGINAL SCAG REPLACEMENT PARTS WILL VOID THE WARRANTY.

When ordering parts, always give the model and serial number of your tractor. The serial number plate is located where shown in Figure 1-1.



STC 2001 SPL-1

Figure 1-1 Tractor Serial Number Plate Location

For pictorial clarity, some illustrations and figures in this manual may show shields, guards or plates open or removed. Under no circumstances should your mower be operated without these devices in place.

All information is based upon product information available at the time of approval for printing. Scag Power Equipment reserves the right to make changes at any time without notice and without incurring any obligation.

1.2 DIRECTION REFERENCE

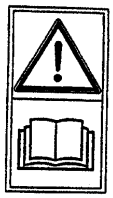
The "Right" and "Left", "Front" and "Rear" of the machine are referenced from the operator's right and left when seated in the normal operating position and facing the forward travel direction.

1.3 SERVICING THE ENGINE AND DRIVE TRAIN COMPONENTS

The detail servicing and repair of the engine, hydraulic pumps and gearboxes are not covered in this manual; only routine maintenance and general service instructions are provided. For service of these components during the limited warranty period, it is important to contact your Scag dealer or find a local authorized servicing agent of the component manufacturer. Any unauthorized work done on these components during the warranty period may void your warranty.

ISO Symbols CE Mark

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Choke		Transmission
	Parking Brake		Spinning Blade
	On/Start		Spring Tension on Idler
	Off/Stop		Oil
			Falling Hazard

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Fast		Slow
	Continuously Variable - Linear		Cutting Element - Basic symbol
	Pinch Point		Cutting Element - Engage
	Hourmeter/Elapsed Operating Hours		Cutting Element - Disengage
	Thown Object Hazard Keep Bystanders Away		Read Operator's Manual

SAFETY INFORMATION

2.1 INTRODUCTION

Your mower is only as safe as the operator. Carelessness or operator error may result in serious bodily injury or death. Hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, maintenance and storage of the equipment. Make sure every operator is properly trained and thoroughly familiar with all of the controls before operating the mower.

READ THIS OPERATOR'S MANUAL BEFORE ATTEMPTING TO START YOUR MOWER.

A replacement manual is available from your authorized Scag Service Dealer or by contacting Scag Power Equipment, Service Department at P.O. Box 152, Mayville, WI 53050 or contact us via the Internet at www.scag.com. Use the contact form to make your request. Please indicate the complete model and serial number of your Scag product when requesting replacement manuals.

2.2 SIGNAL WORDS

This symbol means **"Attention! Become Alert! Your Safety is Involved!"** The symbol is used with the following signal words to attract your attention to safety messages found on the mower decals and throughout this manual. The message that follows the symbol contains important information about safety. To avoid injury and possible death, carefully read the message! Be sure to fully understand the causes of possible injury or death.

Signal Word:

It is a distinctive word found on the mower safety decals and throughout this manual that alerts the viewer to the existence and relative degree of the hazard.

⚠ DANGER:

The signal word "DANGER" denotes that an extremely hazardous situation exists on or near the machine that could result in high probability of death or irreparable injury if proper precautions are not taken.

⚠ WARNING:

The signal word "WARNING" denotes that a hazard exists on or near the machine that can result in injury or death if proper precautions are not taken.

⚠ CAUTION:

The signal word "CAUTION" is a reminder of safety practices on or near the machine that could result in personal injury if proper precautions are not taken.

Your safety and the safety of others depends significantly upon your knowledge and understanding of all correct operating practices and procedures of this machine.

2.3 BEFORE OPERATION CONSIDERATIONS

1. **NEVER** allow children to operate this riding mower. Do not allow adults to operate this machine without proper instructions.

2. **DO NOT** mow when children and/or others are present.

3. Clear the area to be mowed of objects that could be picked up and thrown by the cutter blades.

4. **DO NOT** carry passengers.

2.3 BEFORE OPERATION CONSIDERATIONS (CONT'D)

5. **DO NOT** wear loose fitting clothing that could get tangled in moving parts. Do not operate the machine wearing shorts; always wear adequate protective clothing including long pants. Wearing safety glasses, safety shoes and a helmet is advisable and is required by some local ordinances and insurance regulations.

6. Operator hearing protection is recommended, particularly for continuous operation of the mower. Wear suitable hearing protection. Prolonged exposure to loud noise can cause hearing impairment or loss.

7. Keep the machine and attachments in good operating condition. Keep all shields and safety devices in place. If a shield, safety device or decal is defective or damaged, repair or replace it before operating the machine.

⚠ WARNING:

This machine is equipped with an interlock system intended to protect the operator and others from injury. This is accomplished by preventing the engine from starting unless the deck drive is disengaged, the parking brake is on, the steering control levers are in the neutral position and the operator is in the seat. The system shuts off the engine if the operator leaves the seat with the deck drive engaged and/or the steering control levers not in the neutral position and the parking brake not engaged. Never operate equipment with the interlock system disconnected or malfunctioning.

8. Be sure the interlock switches are functioning correctly.

9. Fuel is flammable; handle it with care. Fill the fuel tank outdoors. Never fill it indoors. Use a funnel or spout to prevent spillage. Clean up any spillage before starting the engine.

10. **DO NOT** add fuel to a running or hot engine. Allow the engine to cool for several minutes before adding fuel.

11. Keep flammable objects (cigarettes, matches, etc.), open flames and sparks away from the fuel tank and fuel container.

12. Equipment must comply with the latest requirements per SAE J137 and/or ANSI/ASAE S279 when driven on public roads.

-NOTE-

If the mower is driven on public roads, it must comply with state and local ordinances as well as SAE J137 and/or ANSI / ASAE S279 requirements. Contact your local authorities for regulations and equipment requirements.

13. **DO NOT** operate without the side discharge chute installed and in the down position.

14. Check the blade mounting bolts at frequent intervals for proper tightness.

15. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before starting the machine.

2.4 OPERATION CONSIDERATIONS

1. Know the function of all controls and how to stop quickly.

2. Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tipping or loss of control. Be especially cautious when changing directions on slopes.

⚠ WARNING:

DO NOT operate on steep slopes. To check a slope, attempt to back up it (with the cutter deck down). If the machine can back up the slope without the wheels slipping, reduce speed and use extreme caution. ALWAYS FOLLOW OSHA APPROVED OPERATION.

2.4 OPERATION CONSIDERATIONS (CONT'D)

3. To prevent tipping or loss of control, start and stop smoothly, avoid unnecessary turns and travel at reduced speed.

4. When using any attachment, never direct the discharge of material toward bystanders or allow anyone near the machine while in operation.

5. Before attempting to start the engine, with the operator in the seat, disengage power to the cutter deck, place the steering control levers in the neutral position and engage the parking brake.

6. If the mower discharge ever plugs, shut off the engine, remove the ignition key, and wait for all movement to stop before removing the obstruction. **Do not use your hand to dislodge the clogged discharge chute.** Use a stick or other device to remove clogged material.

7. Be alert for holes, rocks, roots and other hidden hazards in the terrain. Keep away from any dropoff. Beware of overhead obstructions (low limbs, etc.), underground obstacles (sprinklers, pipes, tree roots, etc.). Cautiously enter a new area. Be alert for hidden hazards.

8. Disengage power to cutter deck before backing up. Do not mow in reverse unless absolutely necessary and then only after observation of the entire area behind the mower.

9. **DO NOT** turn sharply. Use care when backing up.

10. Disengage power to cutter deck before crossing roads, walks or gravel drives.

11. Mow only in daylight or good artificial light.

12. Take all possible precautions when leaving the machine unattended, such as disengaging the mower, lowering the attachments, setting the parking brake, stopping the engine, and removing the key.

13. Disengage power to the attachments when transporting or when not in use.

14. The machine and attachments should be stopped and inspected for damage after striking a foreign object, and damage should be repaired before restarting and operating the machine.

15. **DO NOT** touch the engine or the muffler while the engine is running or immediately after stopping. These areas may be hot enough to cause a burn.

16. **DO NOT** run the engine inside a building or a confined area without proper ventilation. Exhaust fumes are hazardous and could cause death.

2.5 MAINTENANCE CONSIDERATIONS

1. Never make adjustments to the machine with the engine running unless specifically instructed to do so. If the engine is running, keep hands, feet, and clothing away from moving parts.

2. Remove the key from the ignition switch to prevent accidental starting of the engine when servicing or adjusting the machine.

3. Keep all nuts, bolts and screws tight, to ensure the machine is in safe working condition. Check blade mounting bolts frequently to be sure they are tight.

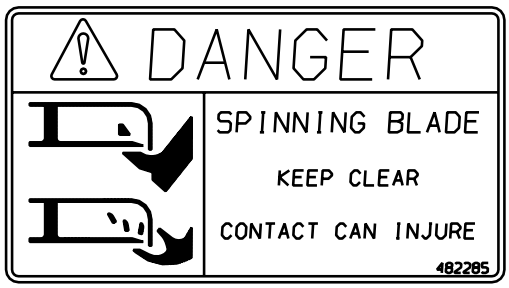
4. Do not change the engine governor settings or overspeed the engine. See the engine operator's manual for information on engine settings.

5. To reduce fire hazard, keep the engine free of grass, leaves, excessive grease, oil and dirt.

6. **Hydraulic fluid is under high pressure.** Keep body and hands away from pinholes or nozzles that eject hydraulic fluid under high pressure. If you need service on your hydraulic system, please see your authorized Scag dealer.

7. Hydraulic fluid under high pressure may have sufficient force to penetrate skin and cause serious injury. If hydraulic fluid is injected into the skin, it must be surgically removed within a few hours by a doctor or gangrene may result.

2.6 SAFETY AND INSTRUCTIONAL DECALS



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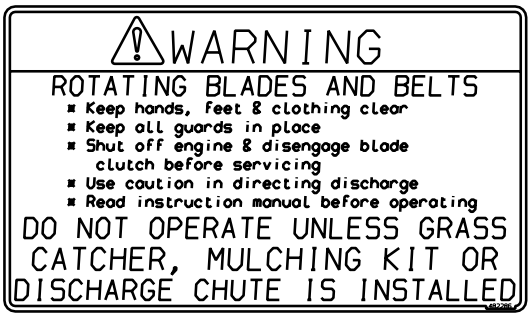
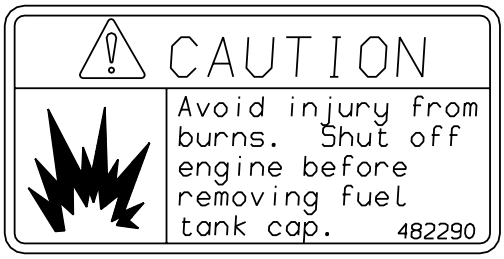
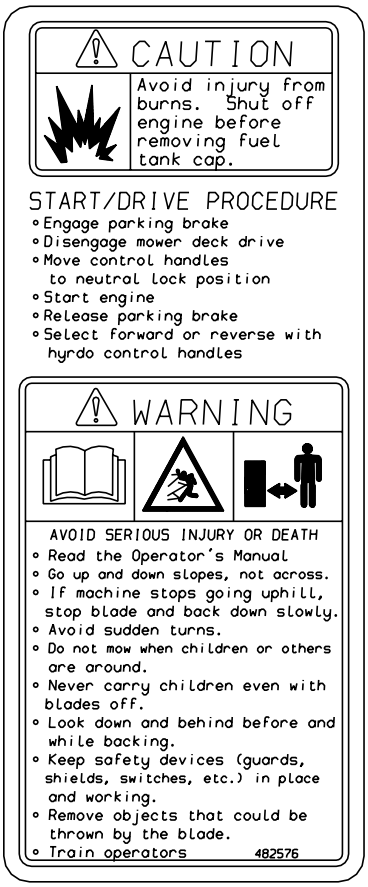
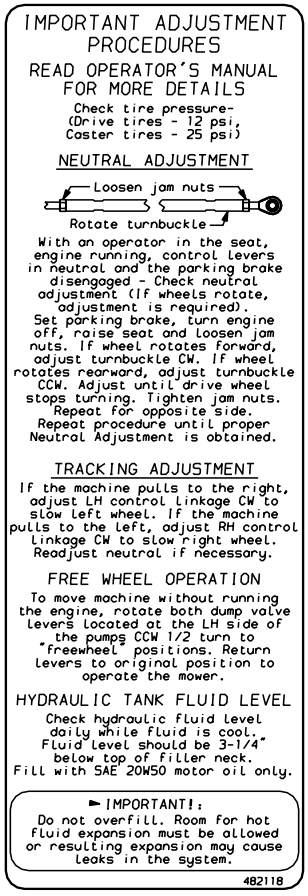

WARNING
ROTATING BLADES AND BELTS
Keep hands, feet & clothing clear
Keep all guards in place
Shut off engine & disengage blade clutch before servicing
Use caution in directing discharge
Read instruction manual before operating
DO NOT OPERATE UNLESS GRASS CATCHER, MULCHING KIT OR DISCHARGE CHUTE IS INSTALLED




CAUTION
Avoid injury from burns. Shut off engine before removing fuel tank cap.
START/DRIVE PROCEDURE
Engage parking brake
Disengage mower deck drive
Move control handles to neutral lock position
Start engine
Release parking brake
Select forward or reverse with hyrdo control handles
WARNING
AVOID SERIOUS INJURY OR DEATH
Read the Operator's Manual
Go up and down slopes, not across.
If machine stops going uphill, stop blade and back down slowly.
Avoid sudden turns.
Do not mow when children or others are around.
Never carry children even with blades off.
Look down and behind before and while backing.
Keep safety devices (guards, shields, switches, etc.) in place and working.
Remove objects that could be thrown by the blade.
Train operators
482576


IMPORTANT ADJUSTMENT PROCEDURES
READ OPERATOR'S MANUAL FOR MORE DETAILS
Check tire pressure-
(Drive tires - 12 psi,
Caster tires - 25 psi)
NEUTRAL ADJUSTMENT
Loosen jam nuts
Rotate turnbuckle
With an operator in the seat, engine running, control Levers in neutral and the parking brake disengaged - Check neutral adjustment (If wheels rotate, adjustment is required).
Set parking brake, turn engine off, raise seat and loosen jam nuts. If wheel rotates forward, adjust turnbuckle CW. If wheel rotates rearward, adjust turnbuckle CCW. Adjust until drive wheel stops turning. Tighten jam nuts.
Repeat for opposite side.
Repeat procedure until proper Neutral Adjustment is obtained.
TRACKING ADJUSTMENT
If the machine pulls to the right, adjust LH control linkage CW to slow left wheel. If the machine pulls to the left, adjust RH control linkage CW to slow right wheel.
Readjust neutral if necessary.
FREE WHEEL OPERATION
To move machine without running the engine, rotate both dump valve levers located at the LH side of the pumps CCW 1/2 turn to "freewheel" positions. Return levers to original position to operate the mower.
HYDRAULIC TANK FLUID LEVEL
Check hydraulic fluid level daily while fluid is cool.
Fluid Level should be 3-1/4" below top of filler neck.
Fill with SAE 20W50 motor oil only.
IMPORTANT!:
Do not overfill. Room for hot fluid expansion must be allowed or resulting expansion may cause leaks in the system.
482118

SPECIFICATIONS

3.1 ENGINE

General Type ..... Heavy Duty Industrial/Commercial Gasoline
Brand ..... Kawasaki, Kohler
Horsepower ..... 19 HP (Spec.#FH601V) (Scag Model STC48A-19KA)
20 HP (Spec.#CV20S) (Scag Model STC48A-20CV)
21 HP (Spec.#FH641V) (Scag Model STC48A-21KA, STC52A-21KA)
23 HP (Spec.#FH680V) (Scag Model STC52A-23KA)
Type 4 Cycle Gasoline, Twin Cylinder, Horizontal Shaft
Cylinders ..... 2 with Cast Iron Sleeves
Governor ..... Mechanical Type with Variable Speed Control Set At 3600 RPM
Idle Speed ..... 1550 RPM - Kawasaki
1900 RPM - Kohler
Kawasaki Fuel Pump Group ..... Mechanical Fuel Pump with In-Line Fuel Filter, Fixed Jet Downdraft Carburetor.
Fuel ..... Non-Leaded Gasoline with a Minimum Octane Rating of 87
Oil Pump Group ..... Positive Displacement Gerotor™ Oil Pump
Starter ..... Electric Starting with Solenoid Shift Starter
Belts: ..... Kevlar cord. Self-adjusting, Self-tightening
Pump Drive Belt ..... Scag Part Number - 482531

3.2 ELECTRICAL

Battery ..... 12 Volt
Charging System ..... Alternator
Charging Output ..... 12 Volt, 13 Amp - Kawasaki
12 Volt, 15 Amp - Kohler
System Polarity ..... Negative Ground
Starter ..... 12 Volt Electric Ring Gear Type, Key and Solenoid Operated Interlock
Switches ..... Seat, Neutral Control, Mower Engagement (BBC), Parking Brake
Instrument Panel ..... Key Switch, Throttle Lever, Manual Choke, PTO Switch, Fuses and Safety Start module
Fuses ..... Two (2) 20 Amp

3.3 TRACTOR

Drive System ..... Hydraulic Drive with Two Variable Displacement Pumps and Two Cast-iron High Torque Motors
Hydrostatic Pumps ..... Two Hydro-Gear™ BDP 10A Pumps with Dump Valves for movement without running the engine
Drive Wheel Motors ..... Two Ross Cast-Iron High Torque Motors
Steering/Travel Control ..... Twin Lever Fingertip Steering Control with Individual Control to Each Wheel with Gas Spring Dampers
Parking Brake ..... Lever Actuated Linkage to Brakes on Both Drive Wheel Axles
Wheels:
(2) Front Caster ..... 13 X 5-6 Four-Ply w/tapered roller bearing pivots
(2) Drive - (48"-52" Deck) ..... 23 X 9.50 X 12 Four-Ply Pneumatic Tubeless, Radius Edge
Fuel Tanks ..... Dual 4.5-Gallon Seamless Polyethylene Tanks with large opening and Fuel Cap
Tire Pressure:
Front Caster ..... 25 PSI
Drive ..... 8 PSI
Seat ..... Padded, Thick Cushion with Extra Spring Support

3.3 TRACTOR (CONT'D)

Travel Speed:
- Forward ..... 0-10 MPH
- Reverse ..... 0-5 MPH

-NOTE-

The machine will travel at 10 mph for transport purposes. For best cutting performance the forward travel speed should be adjusted depending upon the cutting conditions.

3.4 CUTTER DECK

Type: ..... Floating, Adjustable, Anti-scalping, Hybrid Design Combines Out-front and Belly-mount Designs
Construction: ..... Tri-plate deck construction, top of deck consists of three steel plates totaling nearly 1/2" of steel.,7-gauge (3/16") deck skirt.
True Cutting Width: ..... 48" (122.0 cm), 52" (132.0 cm)
Cutting Height Adjustment: ..... Foot Operated Lever Adjustment from Operator's Seat, 1.00" to 5.5" in 1/4"increments
Cutter Blades: ..... 197 Thick, Milled Edge, Wear Resistant Marbain™
Blade Engagement: ..... Electric Blade Engagement Clutch with Control Panel Switch Connected to the Cutter Deck through a Belt.
Discharge Opening: ..... Extra Wide Discharge Opening with Spring Loaded Discharge Chute and Turbo Baffle
Spindles: ..... Heavy-duty 1-1/8" Top Dimension Spindle Shaft, Cast Housing, Taper Roller Bearing, Low Maintenance with Top Access Grease Fitting and Grease Overfill Relief Poppet
Spindle Pulleys: ..... Cast-iron with Easily Removed Taper Hubs
Cutter Deck Belts: ..... B-section with Kevlar Cord. Self-adjusting, Self-tightening
- SMTC48 ..... Scag Part Numbers - 482529
- SMTC52 ..... Scag Part Numbers - 482530

Electric Clutch Type ..... Ogura Heavy Duty PTO Clutch Brake

3.6 HYDRAULIC SYSTEM

Hydraulic Oil Filter ..... 10 Micron Spin-on Element Type
Hydraulic Reservoir ..... Nylon; 2-1/2 Quart Capacity

3.7 PRODUCTIVITY

The following chart will aid you in determining how many acres your Scag mower will cut per day.

The chart is an estimate based on 8 hours per day cutting time at 6 MPH with a 20% allowance for overlap and turns.

Cutting Width:	48"	52"
Acres Per Day:	21	23

OPERATING INSTRUCTIONS

⚠ CAUTION:

Do not attempt to operate this mower unless you have read this manual. Learn the location and purpose of all controls and instruments before you operate this mower.

4.1 CONTROLS AND INSTRUMENT IDENTIFICATION

Before operating the mower, familiarize yourself with all mower and engine controls. Knowing the location, function and operation of these controls is important for safe and efficient operation of the mower.

1. **Ignition Switch (Figure 4-1).** Used to start the engine and has three positions; OFF, ON, and START.

2. **Mower Deck Switch (Figure 4-1).** Used to engage and disengage the mower drive system. Pulling up on the switch will engage the deck drive. Pushing down on the switch will disengage the deck drive.

3. **Engine Choke Control (Figure 4-1).** Used to start a cold engine.

4. **Engine Throttle Control (Figure 4-1).** Used to control the engine speed. Pushing the lever forward decreases engine speed. Pulling the lever back increases engine speed. Full forward position is the IDLE position. Full forward is the cutting position.

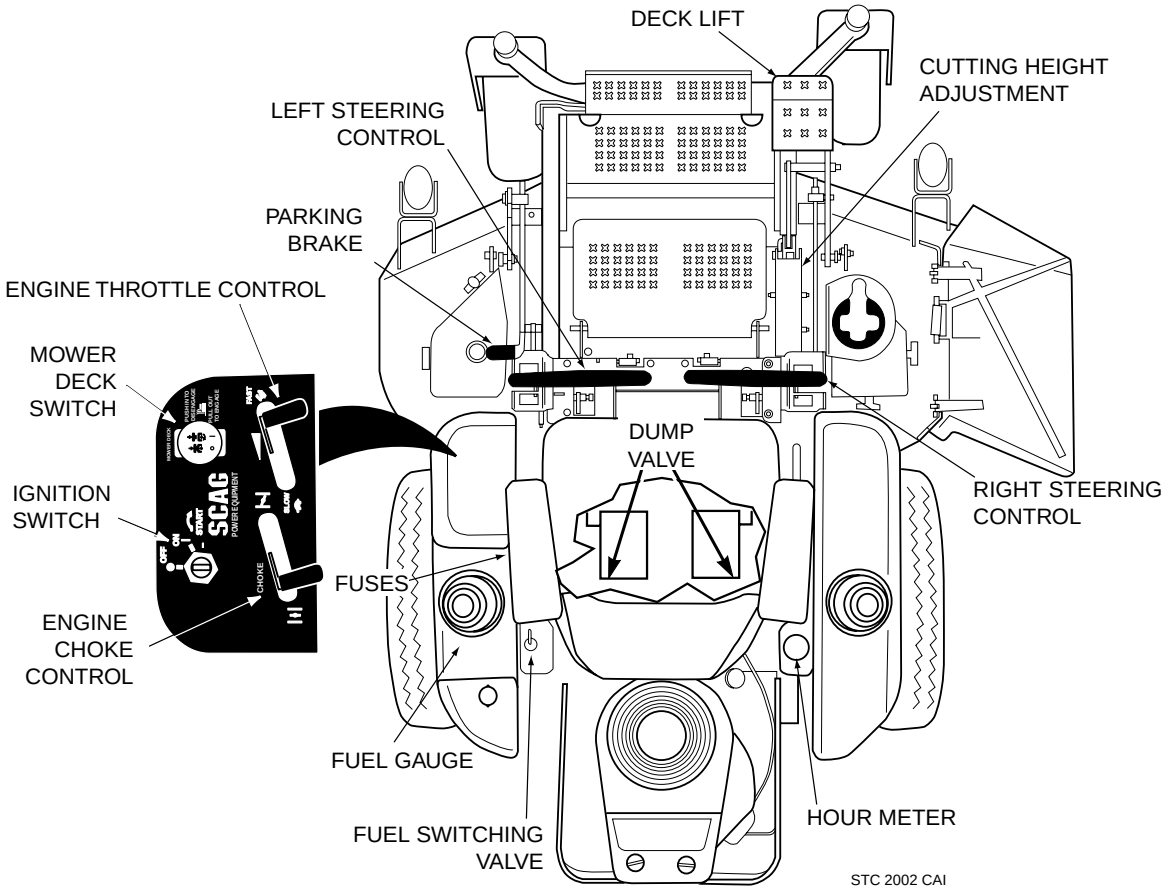


Figure 4-1 Controls and Instruments

5. **Hourmeter (Figure 4-1).** Indicates the number of hours the engine has been operated. It operates whenever the ignition key switch is in the ON position. It can be used to keep track of maintenance intervals and the amount of time required to perform various tasks.

6. **Fuse Holders (Figure 4-1).** Two 20-amp fuses protect the mower's electrical system. To replace fuses, pull fuse out of the socket and install a new fuse.

7. **Left Steering Control (Figure 4-1).** Used to control the mower's left wheel when traveling forward or reverse.

8. **Right Steering Control (Figure 4-1).** Used to control the mower's right wheel when traveling forward or reverse.

9. **Parking Brake Control (Figure 4-1).** Used to engage and disengage the parking brakes. Pull the lever back to engage the parking brakes. Push the lever forward to disengage the parking brakes.

10. **Fuel Switching Valve (Figure 4-1)**. Located on the left side of the machine. Used to shut off fuel supply to the engine and change fuel supply between the fuel tanks. Rotate the valve counter clockwise to supply fuel from the tank on the left side only. Rotate the valve clockwise to supply fuel from the tank on the right side only.

11. **Dump Valve Control Levers (Figure 4-2).** Located on the hydraulic pumps, used to "free-wheel" the mower. Rotating the levers clockwise until they stop allows the unit to move under hydraulic power. The levers must be in this position during operation of the mower. Rotating the levers counter-clockwise, 1-2 turns, allows the mower to be moved by hand (free-wheeling).

12. **Deck Lift Foot Lever (Figure 4-1).** Used to raise and lower the cutter deck.

13. **Cutting Height Adjustment (Figure 4-1).** Used to set the cutter deck at the desired cutting height.

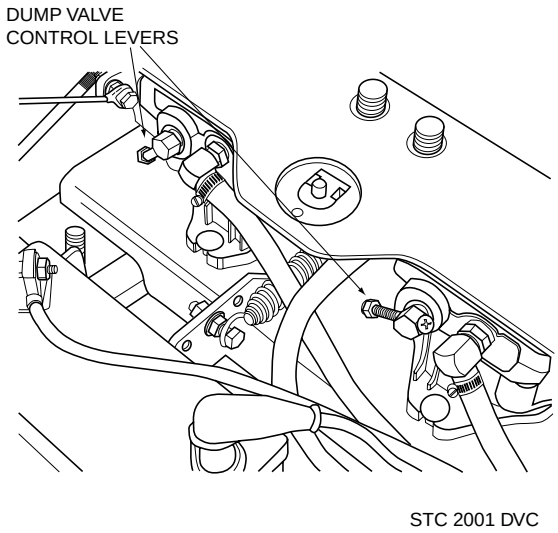


Figure 4-2 Dump Valve Control

14. **Deck Release Lever (Figure 4-1).** Used to lock the cutter deck in the transport position. Push the foot pedal forward and lift up on the release lever to release the cutter deck for normal mowing.

4.2 SAFETY INTERLOCK SYSTEM

The mower is equipped with a safety interlock system that prevents the engine from starting unless the deck drive is disengaged, the parking brake is engaged, the steering control levers are in the neutral position and the operator is in the seat. The interlock system shuts off the engine if the operator leaves the seat with the steering control levers not in the neutral position and/or the cutter blades engaged and the parking brake not engaged.

⚠ WARNING:

Never operate the mower with the interlock system disconnected or malfunctioning. Do not disengage or bypass any switch; injury to yourself and others or property damage could result.

4.3 INITIAL RUN-IN PROCEDURES (First Day of Use or Approximately 10 Hours)

1. Check all belts for proper alignment and wear at 2, 4 and 8 hours.

2. Change the engine oil and oil filter after the first 5 hours of operation. (See Section 7.4.)

3. Check hydraulic oil level in reservoir. (See Section 7.3)

4. Check for loose hardware. Tighten as needed.

5. Check interlock system for proper operation. (See Section 4.2)

6. Check tire pressure. Adjust pressure if necessary. (See Section 7.10)

4.4 STARTING THE ENGINE

⚠ CAUTION:

DO NOT USE STARTING FLUIDS. Use of starting fluids in the air intake system may be potentially explosive or cause a "runaway" engine condition that could result in engine damage and/or personal injury.

1. Be sure the fuel shutoff valve, located behind the operator's seat by the left fuel tank, is completely open. (See section 7.5)

2. Sit in the operator's seat and place the steering control levers in the neutral position.

3. Engage the parking brake.

4. If the engine is cold, choke the engine as needed.

5. Move the engine throttle control to about half engine speed.

6. Turn the ignition key to the START position and release the key as soon as the engine starts. Do not hold the key in the START position for more than 15 seconds at a time. Allow at least 60 seconds between each cranking attempt to prevent overheating of the starter motor. Prolonged cranking can damage the starter motor and shorten battery life.

7. Allow engine to warm before operating the mower.

4.5 GROUND TRAVEL AND STEERING

-IMPORTANT-

If you are not familiar with the operation of a machine with lever steering and/or hydrostatic transmissions, the steering and ground speed operations should be learned and practiced in an open area, away from buildings, fences, or obstructions. Practice until you are comfortable with the handling of the machine before attempting to mow. Learn the operation on flat ground before operating on slopes.

-IMPORTANT-

Start practicing with a slow engine speed and slow forward travel. Learn to feather the steering controls to obtain a smooth operating action.

Forward Travel

To travel forward with the mower, disengage the parking brake, pull levers inward out of the neutral lock position and slowly push the steering control levers forward an equal distance. The further the steering control levers are pushed forward the greater the forward speed will be. To increase the speed, push the steering control levers further forward and to decrease the speed, pull the steering control levers back.

To stop the forward travel, pull the steering control levers back to the neutral position.

To steer the mower left while traveling forward, pull the left steering lever back. The further the lever is pulled back, the quicker the mower will turn left.

To steer the mower right while traveling forward, pull the right steering control lever back. The further the lever is pulled back, the quicker the mower will turn right.

-NOTE-

Smooth operation of the steering levers will produce smooth mower operation. While learning the operation of the steering controls, keep the travel speed low.

-IMPORTANT-

Do not travel forward over a curb. The mower may hang up on the curb. Raise the deck and travel backwards over the curb at a 45 degree angle. (see section 4.1, item 13 for cutter deck raising instructions)

Reverse Travel

⚠ CAUTION:

Disengage power to the mower before backing up. Do not mow in reverse unless absolutely necessary and then only after observation of the entire area behind the mower.

⚠ CAUTION:

Before backing up, observe the rear for persons and obstructions. Clear the area before backing up. Possible injury or property damage could occur.

To travel in reverse, pull levers inward out of the neutral lock position and pull both handles back. Keep the travel speed low while traveling in reverse.

-NOTE-

The mower may not travel straight in reverse. Slight adjustments must be made using the steering controls.

To steer left while traveling in reverse, allow the left steering control lever to move forward. The futher the control is allowed to move forward, the quicker the mower will turn left.

To steer right while traveling in reverse, allow the right steering control lever to move forward. The further the control is allowed to move forward, the quicker the mower will turn right.

To stop the reverse travel, allow the steering control levers to return to the neutral position. If the mower is to be parked, place the handles in the neutral lock position and engage the parking brake.

4.6 ENGAGING THE DECK DRIVE (CUTTER BLADES)

1. Set the throttle at about 3/4 speed. Do not attempt to engage the deck drive at high speed as this shortens the electric clutch life — use only moderate engine speed when engaging the deck drive.

2. Engage the deck drive by pulling out on the yellow switch, located on the instrument panel, (Figure 4-3) to the engage position.

-NOTE-

A squealing noise may be heard when engaging or disengaging the deck drive. It is caused by the electric clutch plates meshing as the mower comes up to speed. This is normal.

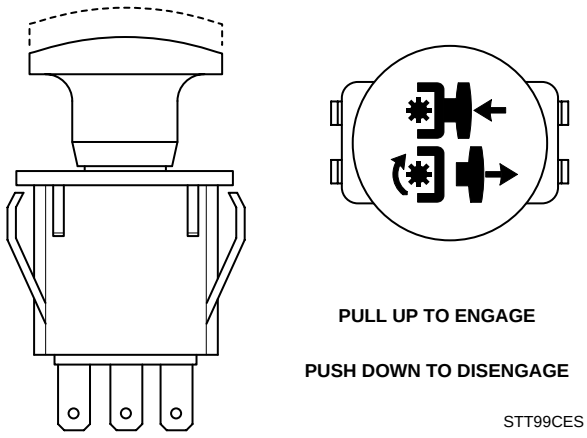


Figure 4-3 Cutter Engage Switch

3. To disengage the deck drive, push the switch in to the disengage position.

4. Always operate the engine at full throttle to properly maintain cutting speed. If the engine starts to lug down, reduce the forward speed and allow the engine to operate at maximum RPM.

4.7 HILLSIDE OPERATION

⚠ WARNING:

DO NOT operate on steep slopes. To check a slope, attempt to back up it (with the cutter deck down). If the machine can back up the slope without the wheels slipping, reduce speed and use extreme caution. ALWAYS FOLLOW OSHA APPROVED OPERATION.

1. This mower has been designed for good traction and stability under normal mowing conditions. However, caution must be used when traveling on slopes, especially when the grass is wet. Wet grass reduces traction and steering control.

2. To prevent tipping or loss of control, do not start or stop suddenly, avoid unnecessary turns and travel at reduced speed.

3. Keep tires properly inflated.

4.8 PARKING THE MOWER

1. Place the steering control levers in the neutral position.

2. Disengage the cutter blades

3. Slow the engine to idle speed.

4. Engage the parking brake.

5. Turn the ignition key to the OFF position and remove the key.

4.9 AFTER OPERATION

1. Wash the entire mower after each use. Do not use high pressure spray or direct the spray onto electrical components.

   -IMPORTANT-
   Do not wash a hot or running engine. Cold water will damage the engine. Use compressed air to clean the engine if it is hot.

2. Keep the entire mower clean to inhibit serious heat damage to the engine or hydraulic oil circuit.

3. Check the drive belts for proper alignment and any signs of wear. Correct and adjust if necessary.

⚠ DANGER:

To avoid injury from burns, allow the mower to cool before removing the fuel tank cap and refueling.

4. After the mower has cooled down, fill the fuel tanks with fresh, clean fuel at the end of every day of operation. See Engine Owner's Manual for proper octain requirements.

5. Check the tire pressure. Adjust pressure if necessary.

4.10 REMOVING CLOGGED MATERIAL

⚠ DANGER:

ROTATING BLADES

NEVER PUT YOUR HANDS INTO THE DISCHARGE CHUTE FOR ANY REASON! Shut off the engine and remove the key and only then use a stick or similar object to remove material if clogging has occurred.

1. If the discharge chute becomes clogged, shut off the engine and remove the ignition key. Using a stick or similar item, dislodge the clogged material. Then resume normal mowing.

4.11 MOVING MOWER WITH ENGINE STOPPED

To “free-wheel” or move the mower around without the engine running, place the dump valve levers in the FREE-WHEEL position (Figure 4-2, Page 11). Disengage the parking brake and move the mower by hand. The dump valve levers must be returned to the DRIVE position to drive the mower.

4.12 RECOMMENDATIONS FOR MOWING

1. Do not mow with dull blades. A dull blade will tear grass, resulting in poor lawn appearance and require more engine power.

2. The discharge chute must not be removed and must be kept in the lowest position to deflect grass clippings and thrown objects downward. Direct the side discharge away from sidewalks or streets to minimize cleanup of clippings. When mowing close to obstacles, direct the discharge away from the obstacles to reduce the chance of property damage by thrown objects.

3. Cut grass when it is dry and not too tall. Do not cut grass too short (cut off 1/3 or less of existing grass for best appearance). Mow frequently.

4. Keep mower and discharge chute clean.

5. When mowing wet or tall grass, mow the grass twice. Raise the mower to the highest setting for the first pass and then make a second pass to the desired height.

6. Use a slow travel speed for trimming purposes.

7. Operate the engine at full throttle for best cutting. Mowing with a lower RPM causes the mower to tear the grass. The engine is designed to be operated at full speed.

8. Use the alternate stripe pattern for best lawn appearance. Vary the direction of the stripe each time the grass is mowed to avoid wear patterns in the grass.

4.13 ADJUSTING CUTTING HEIGHT

The mower deck can be adjusted from a height of 1-inch to 5-1/2 inches at 1/4-inch intervals. To adjust the cutting height:

⚠WARNING:

Do not adjust the cutting height with the mower blades rotating. Disengage the power to the cutter blades and then adjust cutting height.

1. Disengage the power to the cutter blades.

2. Push the cutting height adjustment foot pedal all the way forward using your right foot until it locks in place. (Figure 4-5)

3. Insert the lanyard pin into the cutting height index at the desired cutting height. Push forward on the deck lift foot lever, hold in place and lift up on the deck release lever, (Figure 4-4). Slowly release the foot pedal. A deck height decal is located on the cutting height index as an aid in adjusting the deck to the desired height. (Figure 4-5)

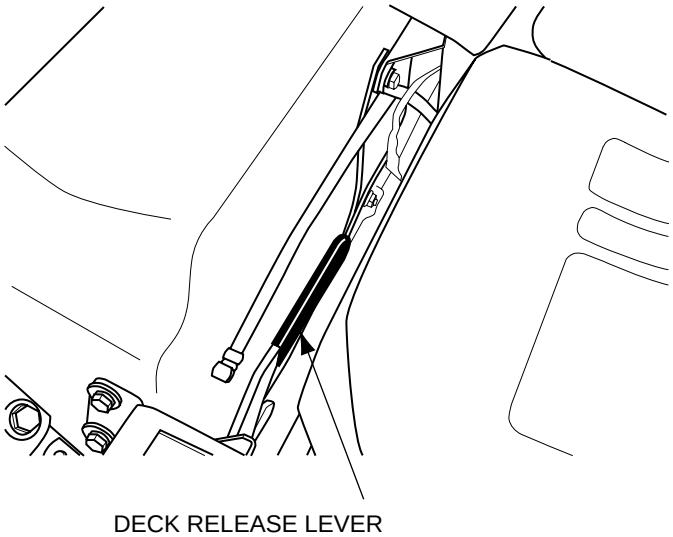


Figure 4-4 Deck Release Lever

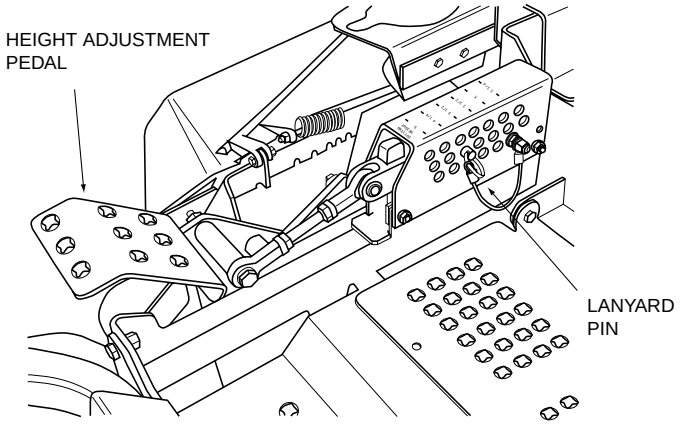


Figure 4-5 Adjusting Cutting Height

4.14 Towing (optional hitch accessory)

1. Never allow children or others in or on towed equipment.

2. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.

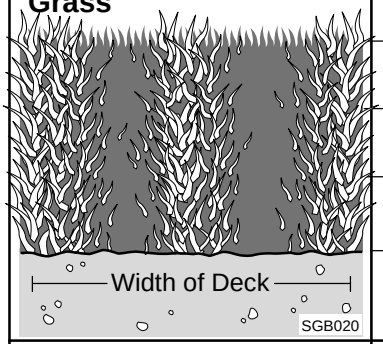
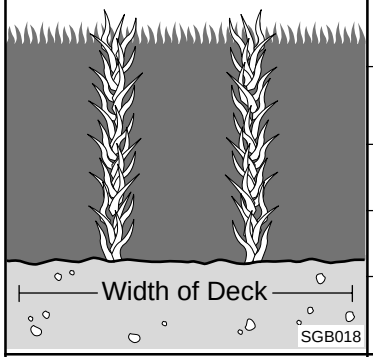
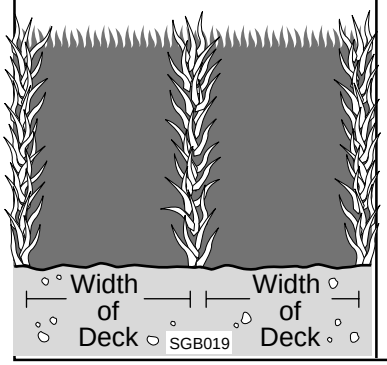
3. Follow manufacturer's recommendations for weight limit for towed equipment. 250lbs. maximum towing weight.

4. Never tow on slopes. The weight of the towed equipment may cause loss of traction and loss of control.

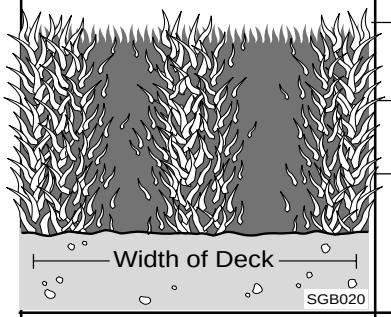
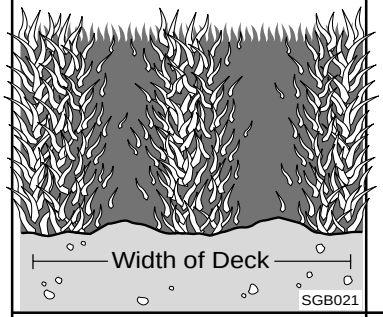
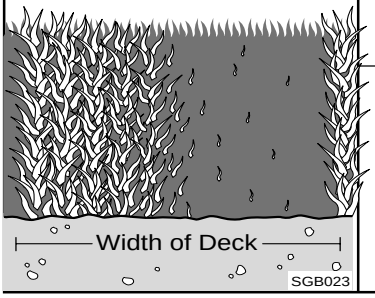
5. Travel slowly and allow extra distance to stop.

6. Zero turning with a trailer attached, could cause damage to the trailer or mower.

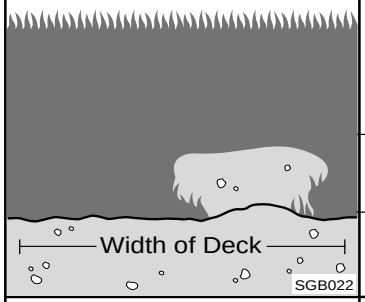
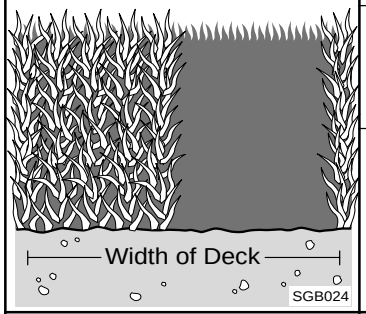
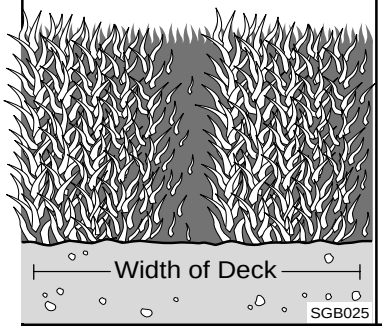
TROUBLESHOOTING CUTTING CONDITIONS

CONDITION	CAUSE	CURE
Stringers - Occasional Blades of Uncut Grass 	Low engine RPM	Run engine at full RPM
	Ground speed too fast	Slow speed to adjust for conditions
	Wet grass	Cut grass after it has dried out
	Dull blades, incorrect sharpening	Sharpen blades
	Deck plugged, grass accumulation	Clean underside of deck
	Belts slipping	Adjust belt tension
Streaking - Strips of Uncut Grass in Cutting Path 	Dull, worn blades	Sharpen blades
	Incorrect blade sharpening	Sharpen blades
	Low engine RPM	Run engine at full RPM
	Belt slipping	Adjust belt tension
	Deck plugged, grass accumulation	Clean underside of deck
	Ground speed too fast	Slow speed to adjust for conditions
	Wet grass	Cut grass after it has dried out
	Bent blades	Replace blades
Streaking - Strips of Uncut Grass Between Cutting Paths 	Not enough overlapping between rows	Increase the overlap of each pass

TROUBLESHOOTING (CONT'D)

CONDITION	CAUSE	CURE
Uneven Cut on Flat Ground - Wavy High-Low Appearance, Scalloped Cut, or Rough Contour 	Lift worn from blade	Replace blade
	Blade upside down	Mount with cutting edge toward ground
	Deck plugged, grass accumulation	Clean underside of deck
	Too much blade angle (deck pitch)	Adjust pitch and level
	Deck mounted improperly	See your authorized SCAG dealer
	Bent spindle area	See your authorized SCAG dealer
	Dull blade	Sharpen blade
Uneven Cut on Uneven Ground - Wavy Appearance, High-Low Scalloped Cut, or Rough Contour 	Uneven ground	May need to reduce ground speed, raise cutting height, and/or change direction of cut
Sloping Ridge Across Width of Cutting Path 	Tire pressures not equal	Check and adjust tire pressure
	Wheels uneven	Check and adjust tire pressure
	Deck mounted incorrectly	See your authorized SCAG dealer
	Deck not level side-to side	Check for level and correct

TROUBLESHOOTING (CONT'D)

CONDITION	CAUSE	CURE
Scalping - Blades Hitting Dirt or Cutting Very Close to the Ground 	Low tire pressures	Check and adjust pressures
	Ground speed too fast	Slow speed to adjust for conditions
	Cutting too low	May need to reduce ground speed, raise cutting height, change direction of cut, and/or change pitch and level
	Rough terrain	May need to reduce ground speed, raise cutting height, and/or change direction of cut
	Ground speed too fast	Slow speed to adjust for conditions
	Wet grass	Cut grass after it has dried out
Step Cut - Ridge in Center of Cutting path 	Blades not mounted evenly	Adjust pitch and level
	Bent blade	Replace blade
	Internal spindle failure	See your authorized SCAG dealer
	Mounting of spindle incorrect	See your authorized SCAG dealer
Slope Cut - Sloping Ridges Across Width of Cutting Path 	Bent spindle mounting area	See your authorized SCAG dealer
	Internal spindle failure	See your authorized SCAG dealer
	Bent deck housing	See your authorized SCAG dealer

ADJUSTMENTS

6.1 PARKING BRAKE ADJUSTMENT

⚠ WARNING:

Do not operate the mower if the parking brake is not operable. Possible severe injury could result.

The parking brake linkage should be adjusted whenever the parking brake lever is placed in the "ENGAGE" position and the parking brake will not prevent the mower from moving. If the following procedures do not allow you to engage the parking brake properly, contact your Scag dealer for further brake adjustments.

1. Position a floor jack under the rear of the machine. Raise the machine and support it to prevent it from falling. Block the caster wheels to prevent the machine from moving. Remove the drive wheels.

2. With the brake in the engaged position, check the distance between the lower nut on the brake actuator rod and the brake actuator lever on the LH side of the machine. The distance should be 1/8" (See Figure 6-2).

3. If the distance is not at the specified measurement, loosen the jam nut at the clevis on the top of the brake actuator rod (See Figure 6-2).

4. Turn the bolt at the bottom of the brake actuator lever until the 1/8" measurement is achieved and tighten the jam nut at the clevis on the brake actuator rod. (See Figure 6-2). If the 1/8" measurement can not be achieved by adjusting the brake actuator rod, adjust the brake control rod. Adjust by loosening the jam nuts at both ends of the brake control rod and turning the rod until the proper distance is achieved. (See Figure 6-1)

5. Repeat steps 2-4 on the RH side of the machine.

6. Replace the drive wheels and test the brake.

-NOTE-

If this procedure does not achieve proper brake adjustment, please contact your authorized Scag dealer.

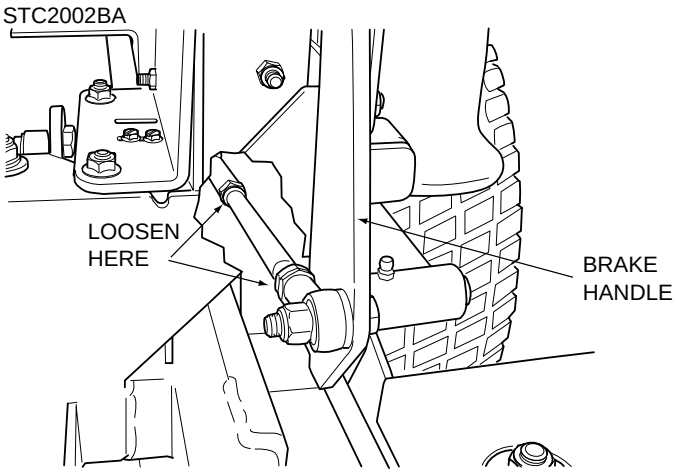


Figure 6-1. Brake Adjustment

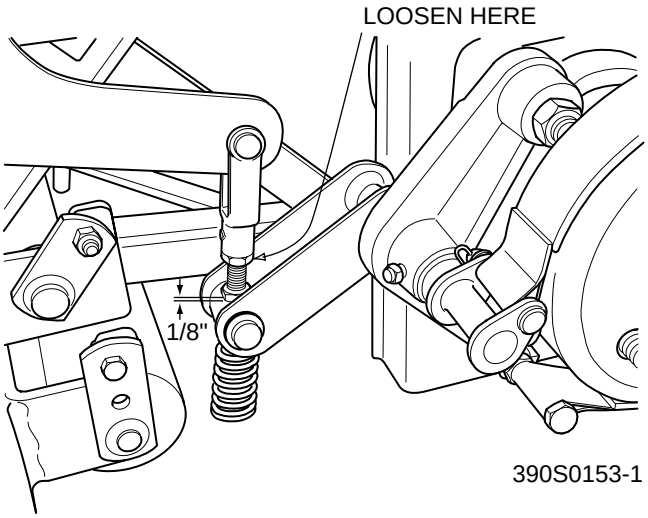


Figure 6-2. Brake Rod Adjustment

6.2 TRAVEL ADJUSTMENTS

Neutral or tracking adjustments will need to be made if:

A. The steering control levers are in the neutral position and the machine creeps forward or backward. (See Neutral Adjustment).

B. The steering control levers are in the full forward position and the mower pulls to one side or the other when traveling in a forward direction. (Tracking Adjustment, See Page 22).

Neutral Adjustment

1. Be sure the dump valve levers are in the run position and the steering control levers are in the neutral lock position.

2. With an operator in the seat, start the engine and disengage the parking brake.

3. Run the engine at full operating speed and check if the machine creeps forward or backwards.

4. Adjust the RH wheel by loosening the jam nuts on the steering control rod and turning the rod until the drive wheel turns in the forward direction. Turn the rod back until the drive wheel stops moving. Turn the rod an additional 1/2 turn. (See Figure 6-3).

5. Tighten the jam nuts and repeat for the LH wheel.

6. Actuate the steering control levers forward and reverse several times and return them to the neutral position.

7. Check that the drive wheels remained in neutral and readjust if necessary.

8. Check that the steering control levers hit the stop before the pumps reach full stroke. Adjust as needed.

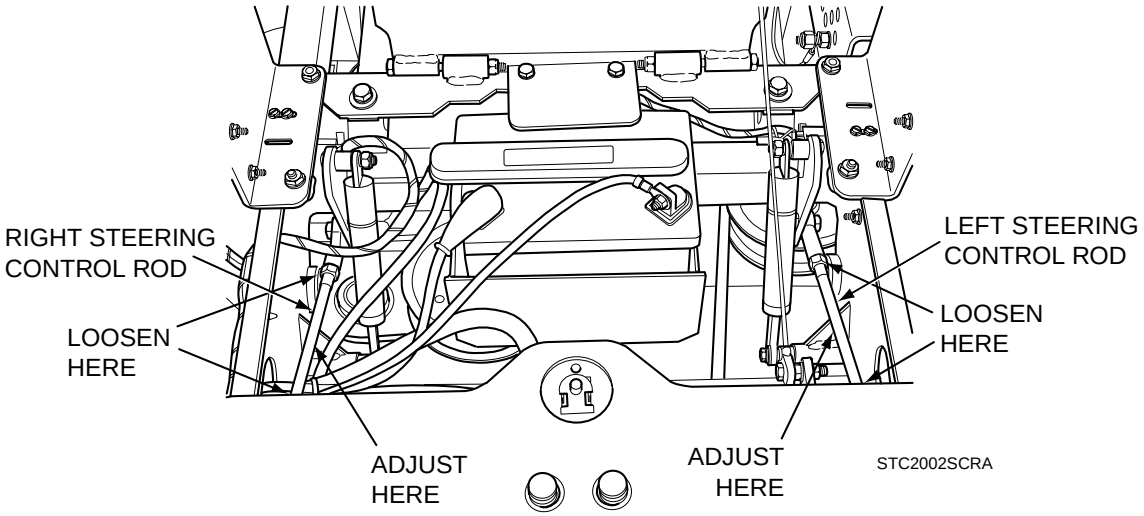


Figure 6-3. Steering Control Rods Adjustment

Tracking Adjustment

⚠ CAUTION:

Stop the engine and remove the key from the ignition before making any adjustments. Wait for all moving parts to come to a complete stop before beginning work.

⚠ CAUTION:

The engine and drive unit can get hot during operation causing burn injuries. Allow engine and drive components to cool before making any adjustments.

-NOTE-

Before proceeding with this adjustment, be sure that the caster wheels turn freely and that the tire pressure in the drive wheels is correct. If the tire pressure is not correct, the machine will pull to the side with the lower pressure.

1. If at full speed the mower pulls right, it is an indication that the left wheel is turning faster than the right wheel. To adjust this condition, proceed as follows:

   A. Stop the machine and place the steering control levers in the neutral position. Loosen the lock nuts securing the ball joints at each end of the LH steering control rod. Rotate the control rod to shorten the rod and tighten the lock nuts. This will cause the control rod to stroke the LH pump less, slowing down the LH wheel. (See Figure 6-3).

-NOTE-

If after making the adjustment as outlined in step 1A, the machine creeps forward or backward, the neutral adjustment must be made as described on page 21.

2. If at full speed the mower pulls left, it is an indication that the right wheel is turning faster than the left wheel. To adjust this condition, proceed as follows:

   A. Stop the machine and place the steering control levers in the neutral position. Loosen the lock nuts securing the ball joints at each end of the RH steering control rod. Rotate the control rod to shorten the rod and tighten the lock nuts. This will cause the control rod to stroke the RH pump less, slowing down the RH wheel. (See Figure 6-3).

-NOTE-

If after making the adjustment as outlined in step 2A, the machine creeps forward or backward, the neutral adjustment must be made as described on page 21.

6.3 THROTTLE CONTROL AND CHOKE ADJUSTMENTS

These adjustments must be performed by your Scag dealer to ensure proper and efficient running of the engine. Should either need adjustment, contact your authorized Scag service center.

6.4 BELT ADJUSTMENT

⚠ WARNING:

Before removing any guards, shut the engine off and remove the ignition key.

All drive belts and cutter deck belts are spring loaded and self-tensioning. The belts should be checked periodically for proper alignment and wear.

6.5 BELT ALIGNMENT

Belt alignment is important for proper performance of your Scag mower. If you experience frequent belt wear or breakage, see your authorized Scag service center for belt adjustment.

6.6 CUTTER DECK ADJUSTMENTS

Cutter deck level, pitch and height are set at the factory. However, if these adjustments should ever need to be made, the following procedures will aid in obtaining the proper cutter deck adjustment.

-NOTE-

Before proceeding with the cutter deck adjustments, be sure that all tires are properly inflated.

Cutter Deck Level

The cutter deck should be level from side-to-side for proper cutting performance. To check for level, be sure that the mower is on a flat, level surface, the tires are properly inflated and the cutter deck is set at the most common cutting height that you will use. On the RH side of the machine, check the distance from the top of the cutter deck to the floor. Next check the distance from the top of the cutter deck to the floor on the LH side of the machine. Both measurements should be the same. If the two measurements are different, the cutter deck level must be adjusted as follows:

1. On the front LH side of the cutter deck locate the cutter deck adjusting bolt. (See Figure 6-4)

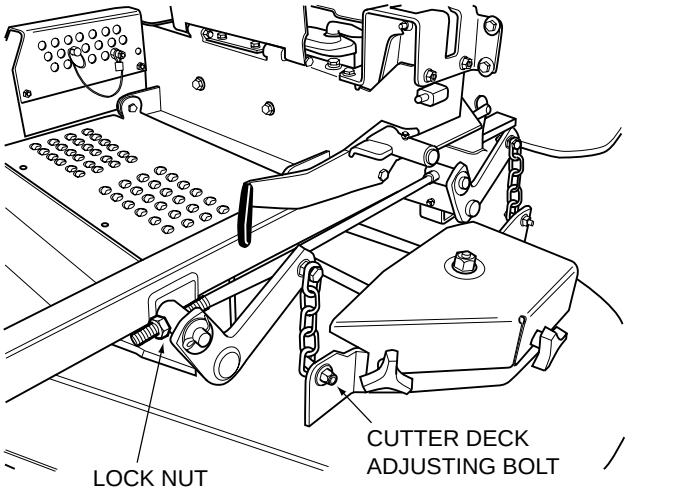


Figure 6-4. Cutter Deck Adjustment

2. Loosen the elastic stop nut and move the bolt up or down in the slot to adjust the cutter deck until the distance from the top of the cutter deck to the floor is the same as the measurement on the RH side of the machine.

3. Tighten the elastic stop nut to secure the cutter deck in the proper position.

Cutter Deck Pitch

The pitch of the cutter deck should be 1/4" down toward the front of the cutter deck for proper cutting performance. To check for proper deck pitch, be sure that the mower is on a flat, level surface and the tires are properly inflated.

Check the distance from the top of the cutter deck to the floor at the rear RH side of the cutter deck directly behind the cutter deck hanging chains. Next check the distance from the top of the cutter deck to the floor at the front RH side of the cutter deck directly in front of the cutter deck hanging chains. The measurement at the front of the cutter deck should be 1/4" lower than the measurement at the rear of the deck. Make these measurements at the LH side of the cutter deck also. If the measurement at the front of the deck is not 1/4" lower, the cutter deck pitch must be adjusted as follows:

1. Loosen the lock nuts on both adjusting rods. (See Figure 6-4)

2. Using an adjustable jaw pliers, turn the adjusting rods on the non threaded portion of the rod until the 1/4" forward pitch is obtained on both the RH and the LH side of the cutter deck. Tighten both lock nuts.

-NOTE-

To prevent the cutter deck from teetering, all four cutter deck hanging chains must have tension on them. If all four chains do not have tension on them and the deck teeters, you must readjust the cutter deck as outlined in the procedures above. All measurements should be taken from the top edge of the deck as the Advantage decks have an uneven bottom edge.

Cutter Deck Height

The cutter deck height adjustment is made to ensure that the cutter deck is cutting at the height indicated on the cutting height index gauge. To check for proper deck height, be sure that the mower is on a flat, level surface and the tires are properly inflated.

1. Place the cutter deck in the transport position. Loosen the jam nuts on both ends of the deck height control rod. (See Figure 6-5)

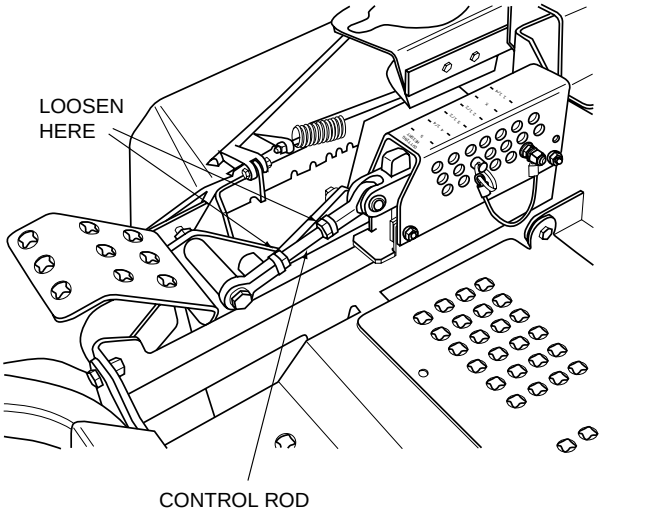


Figure 6-5. Cutter Deck Height Adjustment

2. Turn the control rod (See Figure 6-6) until there is a 1/4" space between the rear deck stop and the top of the cutter deck. (See Figure 6-6). Tighten the jam nuts on the control rod.

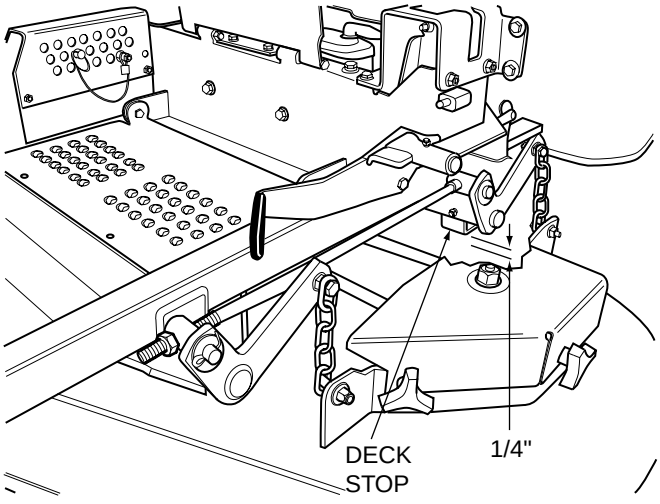


Figure 6-6. Cutter Deck Stop

3. Check the cutter deck cutting height by placing the lanyard pin in the 3" position on the cutting height index. Release the deck from the transport positon and allow the deck to move to the 3" cutting height position.

4. Check the measurement from the floor to the cutter blade tip. If the measurement is not at 3", an adjustment can be made using the deck height control rod. (See Figure 6-5)

-NOTE-

If an adjustment had to be made, be sure that the cutter deck can easily be locked into the transport position.

Custom-Cut Baffle Adjustment

The Custom-Cut Baffle is designed to deliver optimum airflow and superior cutting performance in any type of grass. The Custom-Cut Baffle can be raised or lowered to precisely tailor the deck's performance for the type of grass being cut. The baffle can be set in three (3) different positions for optimum performance.

A. 3" Position - baffle removed. (See Figure 6.8). With the baffle removed, the Advantage cutter deck will deliver the best quality-of-cut in very tall, wiry, tough to cut grass.

B. 3-1/2" Position (factory setting) - baffle is installed using the bottom set of holes on the Custom Cut Baffle. (See Figure 6.9). For general purpose cutting, place the Custom Cut Baffle in the 3-1/2" position. This gives the best mix of cutting performance in all types of grass.

C. 4" Position - baffle is installed using the top set of holes on the Custom Cut Baffle. (See Figure 6.10). Placing the baffle in the 4" setting will enhance fall cutting (leaf pickup) and reduce cutter deck "blowout".

To adjust the Custom-Cut Baffle height:

1. Place the cutter deck in the transport position.

2. Remove the hardware securing the Custom-Cut Baffle to the cutter deck. (See Figure 6.7).

-NOTE-

Hardware location used in the illustrations are for reference only. Location of hardware may vary depending on cutter deck size.

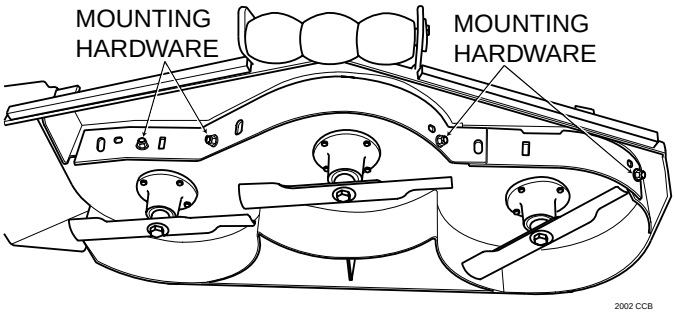


Figure 6-7. Custom Cut Baffle

3. Move the Custom-Cut Baffle to desired position. (See Figures 6.9 through 6.11 for position).

4. Reinstall the mounting hardware as shown. (See Figures 6.10 though 6.11). Torque hardware to 39ft.lbs.

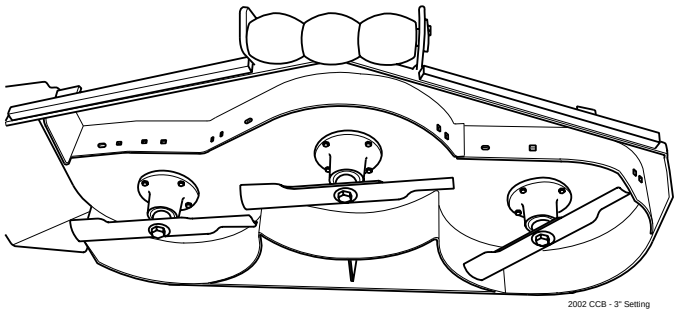


Figure 6-8. 3" Custom Cut Baffle Position

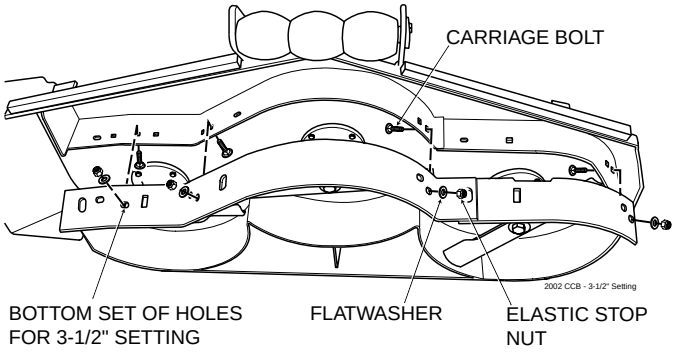


Figure 6-9. 3-1/2" Custom Cut Baffle Position

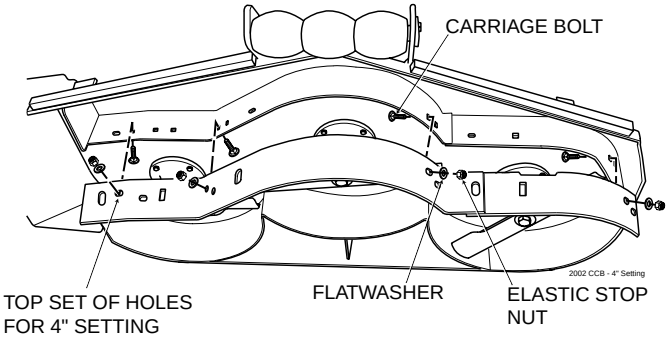


Figure 6-10. 4" Custom Cut Baffle Position

MAINTENANCE

7.1 MAINTENANCE CHART - RECOMMENDED SERVICE INTERVALS

HOURS						Procedure	Comments
Break-In (First 10)	8	40	100	200	500		
X						Check all hardware for tightness	
X						Check hydraulic oil level	See paragraph 7.3
X						Check all belts for proper alignment	See paragraph 7.8
X (First 5)						Change engine oil and filter	See paragraph 7.4
X						Check hydraulic hoses for leaks	Use extreme caution when checking the hydraulic hoses See paragraph 2.5
	X					Check engine oil level	See paragraph 7.4
	X					*Clean mower	See paragraph 7.11
	X					Check condition of blades	See paragraph 7.9
	X					Apply grease to fittings	See paragraph 7.2
	X					Check tire pressure	See paragraph 7.10
		X				Check battery electrolyte level, clean battery posts and cables	See paragraph 7.7
		X				Check belts for proper alignment	See paragraph 7.8
			X			Apply grease to fittings	See paragraph 7.2
			X			Change engine oil	See paragraph 7.4
			X			*Clean air cleaner element	See paragraph 7.6

*** Perform these maintenance procedures more frequently under extreme dusty or dirty conditions.**

MAINTENANCE CHART - RECOMMENDED SERVICE INTERVALS (CONT'D)

HOURS						Procedure	Comments
Break-In (First 10)	8	40	100	200	500		
				X		Apply grease to fittings	See paragraph 7.2
				X		Check hardware for tightness	
				X		Change engine oil filter	See paragraph 7.4
				X		Check hydraulic oil level	See paragraph 7.3
					X	Replace engine fuel filter	See paragraph 7.5
					X	Drain hydraulic system and replace hydraulic oil	See paragraph 7.3 Use SAE 20W50 Motor Oil
					X	Replace hydraulic oil filter	See paragraph 7.3
					X	Adjust electric PTO clutch	See Scag Dealer

7.2 LUBRICATION - GREASE FITTING LUBRICATION CHART (SEE FIGURE 7-1)

	LOCATION	LUBRICATION INTERVAL	LUBRICANT	NO. OF PLACES
1	Caster Wheel Pivot *	500 Hours/Yearly	Chassis Grease	2
2	Caster Wheel Bearings	100 Hours/Bi-Weekly	Chassis Grease	2
3	Brake Actuator	200 Hours/Monthly	Chassis Grease	2
4	Cutter Deck Bellcranks	100 Hours/Bi-Weekly	Chassis Grease	4
5	Cutter Deck Pusharms	100 Hours/Bi-Weekly	Chassis Grease	2
6	Control Pivot	100 Hours/Bi-Weekly	Chassis Grease	2
7	Cutter Deck Spindle	40 Hours/Weekly	+Lithium MP White Grease 2125	3
8	Brake Handle	200 Hours/Monthly	Chassis Grease	1

* **PROCEDURE:** Remove grease cap, part number 481559. Remove plug, part number 482028-01, and install grease zerk. Apply grease to the fitting until new grease appears at the top of the caster extension. Remove the grease zerk and reinstall the plug. Reinstall the grease cap. Special tool, part number 47007, is recommended for use in the installation of the grease cap.

+ Compatible Greases:
Mobilix #2 found at Mobil Service Stations
Ronex MP found at Exxon Service Stations
Super Lube MEP #2 & Super Stay-M #2 found at Conoco Stations
Shell Alvania #2 found at Shell Service Stations
Lidok EP #2 found at industrial shops

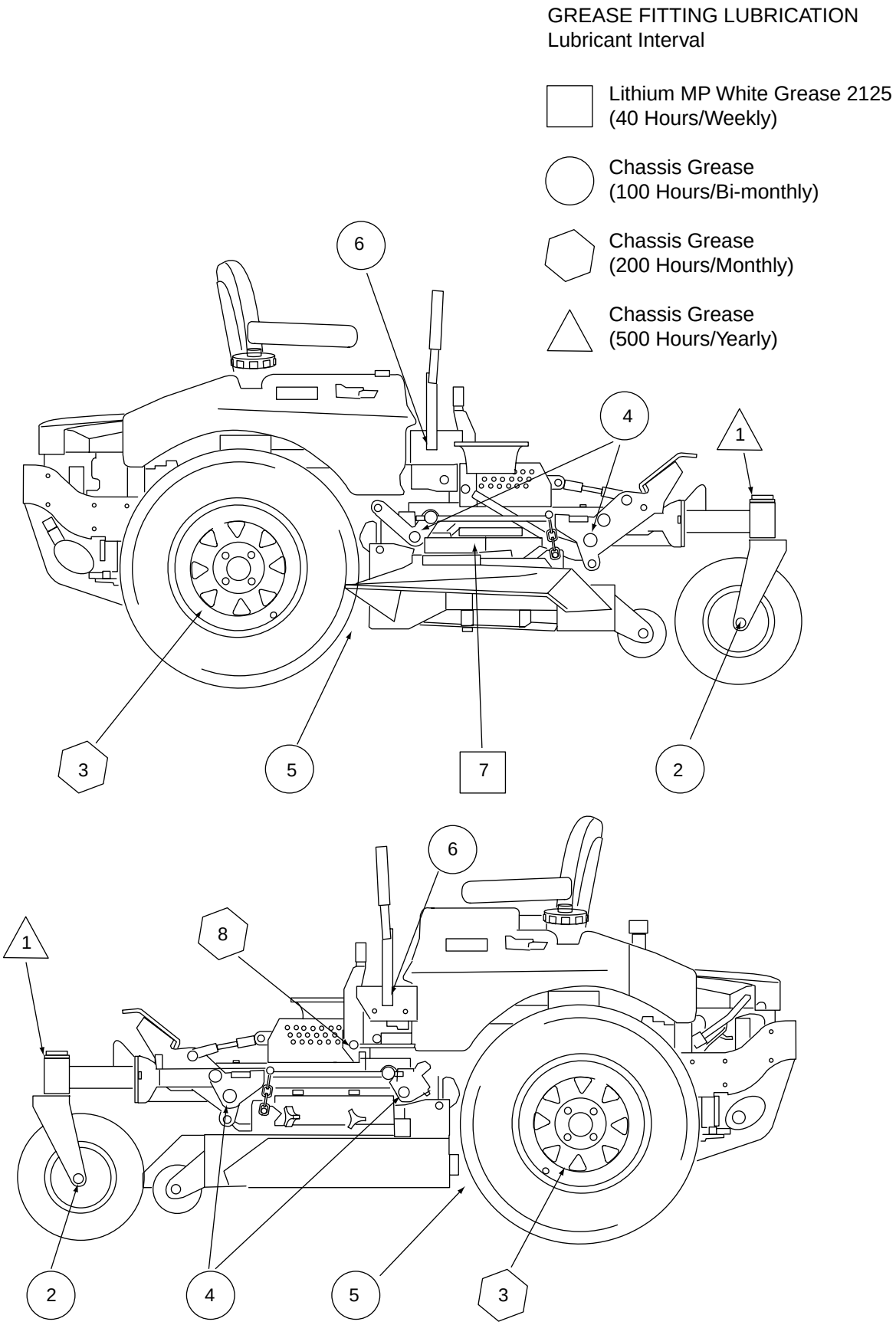


Figure 7.1 Lubrication Fitting Points

7.3 HYDRAULIC SYSTEM

A. Checking Hydraulic Oil Level

The hydraulic oil level should be checked after the first 10 hours of operation. Thereafter, check the oil after every 200 hours of machine operation or monthly, whichever occurs first.

-IMPORTANT-

If the oil level is consistently low, check for leaks and correct immediately.

1. Wipe dirt and contaminants from around the reservoir cap. Remove the cap from the hydraulic oil reservoir.

2. Visually check the level of hydraulic oil. Hydraulic oil must be at least 3" inches from top of the filler neck. If the level cannot be determined visually, use a clean tape measure to check the level. If the fluid is low, add 20W50 motor oil. DO NOT overfill; (overfilling the oil reservoir may cause oil seepage).

3. Clean the fill cap and install it onto the reservoir.

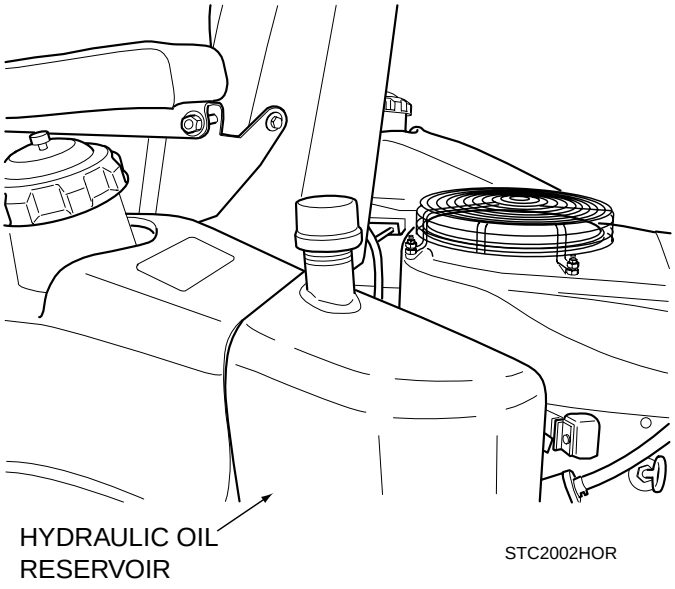


Figure 7-2 Hydraulic Oil Reservoir

B. Changing Hydraulic Oil

The hydraulic oil should be changed after every 500 hours or annually, whichever occurs first. The oil should also be changed if the color of the fluid has become black or milky. A black color and/or a rancid odor usually indicates possible overheating of the oil, and a milky color usually indicates water in the hydraulic oil.

-IMPORTANT-

The hydraulic oil should be changed if you notice the presence of water or a rancid odor to the hydraulic oil.

1. Park the mower on a level surface and stop the engine.

2. Place a suitable container under the hydraulic oil filter. Tilt the seat forward. Remove the fill cap from the reservoir and the drain plug from the bottom of the drain tee fitting on the front side of the filter base. (See Figure 7-3). Allow the fluid to drain into the container and properly discard it.

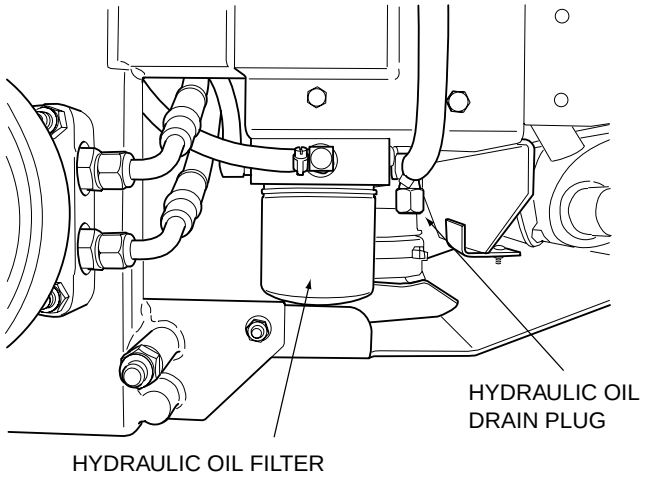


Figure 7-3 Hydraulic Oil Filter and Drain Plug

3. Re-install the drain plug into the tee fitting and be sure it is tight.

-NOTE-

Before refilling the hydraulic oil reservoir the hydraulic oil filter should be changed as outlined in section C -Changing Hydraulic Oil Filter Element- on the next page.

4. Fill the reservoir to 3-1/4" inches from the top of the filler neck with SAE 20W50 motor oil.

5. Replace the reservoir fill cap. Start the engine and drive forward and backward for two minutes. Check the oil level in the reservoir. If necessary, add oil to the reservoir.

C. Changing Hydraulic Oil Filter Element

The hydraulic oil filter should be changed after every 500 hours of operation or annually, whichever occurs first.

1. Remove the oil filter element (Figure 7-3) and properly discard it. Fill the new filter with clean SAE 20W50 engine oil and install the filter. Hand tighten only.

2. Run the engine at idle speed with the speed control lever in neutral for five minutes.

3. Check the oil level in the hydraulic tank. It must be 3" inches from the top of the filler neck. If necessary, add SAE 20W50 motor oil.

7.4 ENGINE OIL

A. Checking Engine Crankcase Oil Level

The engine oil level should be checked after every 8 hours of operation or daily as instructed in the Engine Operator's Manual furnished with this mower.

B. Changing Engine Crankcase Oil

After the first 5 hours of operation, change the engine crankcase oil and replace the oil filter. Thereafter, change the engine crankcase oil after every 100 hours of operation or bi-weekly, whichever occurs first. Refer to the Engine Operator's Manual furnished with this mower for instructions.

C. Changing Engine Oil Filter

After the first 5 hours of operation, replace the engine oil filter. Thereafter, replace the oil filter after every 200 hours of operation or every month, whichever occurs first. Refer to Engine Operator's Manual for instructions.

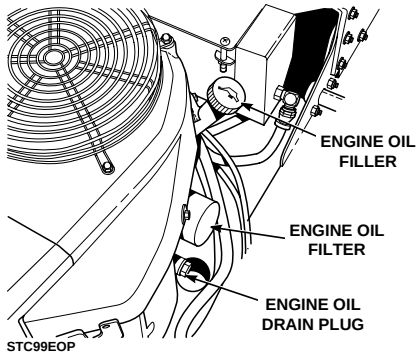


Figure 7-5 Kawasaki Engine Oil Fill/Dipstick, Filter and Drain Plug Locations

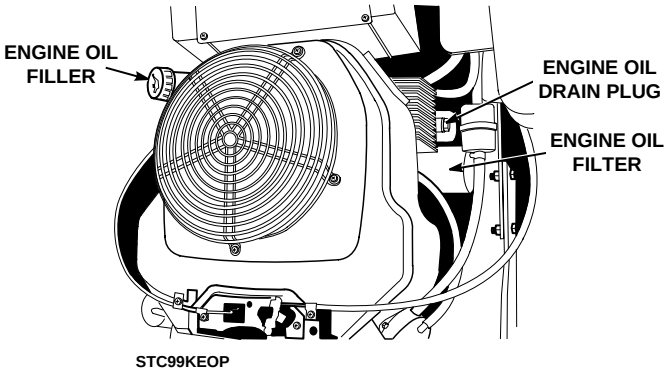


Figure 7-6 Kohler Engine Oil Fill/Dipstick, Filter, and Drain Plug Locations

7.5 ENGINE FUEL SYSTEM

⚠ DANGER:

To avoid injury from burns, allow the mower to cool before removing the fuel tank cap and refueling.

A. Filling the Fuel Tank

Fill the fuel tank at the end of each operating day to within 1 inch below the filler neck. Do not overfill. Use clean, fresh unleaded gasoline with a minimum octane rating of 87.

B. Replacing In-Line Fuel Filter Element

The in-line fuel filter (Figure 7-7, Figure 7-8 on Page 30) should be replaced after every 500 hours of operation or annually, whichever occurs first.

1. Close the shutoff valve. Remove the two clamps securing the fuel filter to the fuel hose. Remove the fuel filter, noting the proper direction.

2. Install a new fuel filter. Be sure it is installed in the proper direction. Secure to the fuel hose using the two clamps.

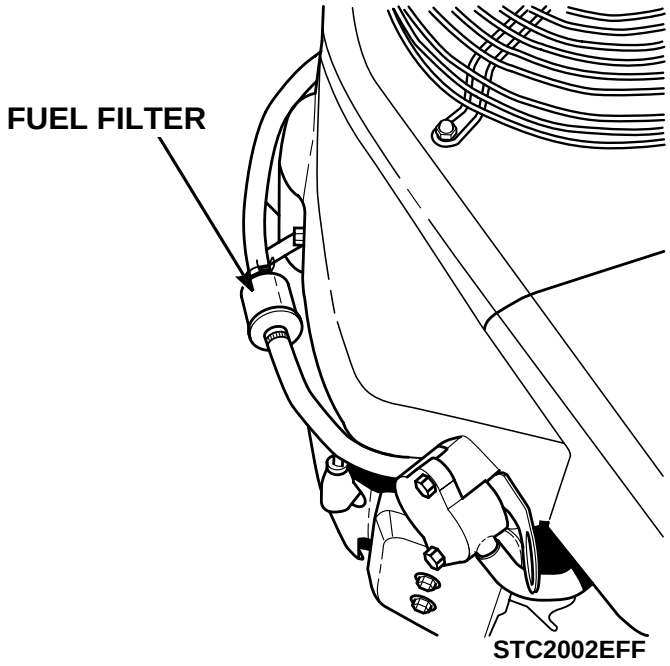


Figure 7-7 Kawasaki Fuel Filter Location

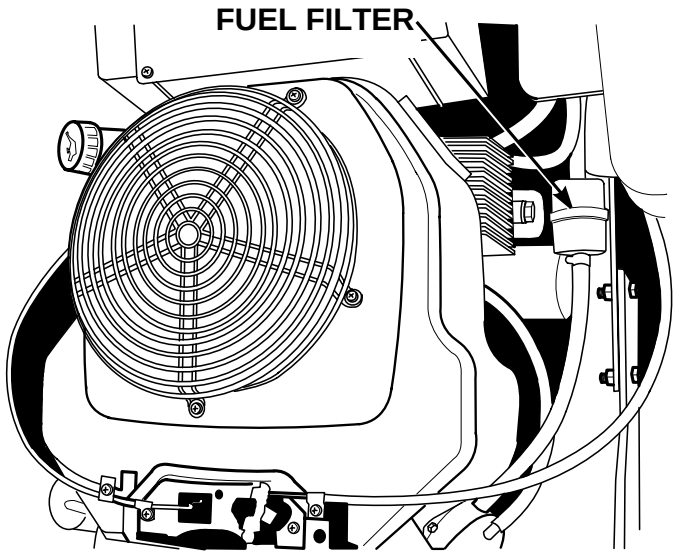


Figure 7-8 Kohler Fuel Filter Location

7.6 ENGINE AIR CLEANER

A. Cleaning and/or Replacing Air Cleaner Element

For any air cleaner, the operating environment dictates the air cleaner service periods. Inspect and clean the air cleaner element after every 100 hours of operation or bi-weekly, whichever occurs first and replace the element if required.

-NOTE-

In extremely dusty conditions it may be necessary to check the element once or twice daily to prevent engine damage.

1. For the KH model, remove the wing nut securing the air cleaner cover to the engine. For the KA model, remove the two wing nuts securing the air cleaner cover to the engine. Remove the air cleaner cover and set aside.

2 Remove the air cleaner and inspect.

3. Clean or replace the air cleaner and foam pre-cleaner as recommended by the engine manufacturer.

7.7 BATTERY

A. Checking Electrolyte Level and Cleaning Battery

After every 40 hours of operation or weekly, whichever occurs first, check the electrolyte level in the battery and clean the battery and connections. Dirt and fluid on the top of the battery can cause the battery to discharge. Corrosion of the battery terminals or loose connections will cause poor battery performance.

⚠WARNING:

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

⚠WARNING:

Lead-acid batteries produce flammable and explosive gases. To avoid personal injury when checking, testing or charging batteries, DO NOT use smoking materials near batteries. Keep arcs, sparks and flames away from batteries. Provide proper ventilation and wear safety glasses.

⚠WARNING:

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

1. Remove the battery cell caps. Visually inspect electrolyte level in the cells. If electrolyte is below the bottom of vent well, fill with clean distilled water to the bottom of vent wells (1/4 to 1/2 inch above the plates). Install the battery cell caps.

-IMPORTANT-

Do not overfill the battery. Electrolyte will overflow through the vent tube onto parts of the machine, resulting in severe corrosion.

2. Clean the cable ends and battery posts with steel wool. Use a solution of baking soda and water to clean the battery. Do not allow the solution to enter the battery cells.

3. Tighten the cable connections securely and apply a light coat of silicone dielectric grease to the terminal connections to prevent corrosion.

⚠WARNING:

Electric storage battery fluid contains sulfuric acid which is POISON and can cause SEVERE CHEMICAL BURNS. Avoid contact of fluid with eyes, skin, or clothing. Use proper protective gear when handling batteries. DO NOT tip any battery beyond 45° angle in any direction. If fluid contact does occur, follow first aid suggestions below.

BATTERY ELECTROLYTE FIRST AID

EXTERNAL CONTACT — Flush with water.

EYES — Flush with water for at least 15 minutes and get medical attention immediately.

INTERNAL — Drink large quantities of water. Follow with Milk Of Magnesia, beaten egg, or vegetable oil. Get medical attention immediately. In case of internal contact, DO NOT give fluids that would induce vomiting.

B. Charging the Battery

Refer to the battery charger's manual for specific instructions.

Under normal conditions the engine's alternator will have no problem keeping a charge on the battery. If the battery has been completely discharged for a long period of time, the alternator may not be able to recharge the battery, and a battery charger will be required.

DO NOT charge a frozen battery. It may explode and cause injury. Let the battery warm before attaching a charger.

Whenever possible, remove the battery from the mower before charging and make sure the electrolyte covers the plates in all cells.

⚠WARNING:
BATTERIES PRODUCE EXPLOSIVE GASES. Charge the battery in a well ventilated space so gases produced while charging can dissipate.

Charging rates between 3 and 50 amperes are satisfactory if excessive gassing or spewing of electrolyte does not occur or the battery does not feel excessively hot (over 125°F). If spewing or gassing occurs or the temperature exceeds 125°F, the charging rate must be reduced or temporarily stopped to permit cooling.

C. Jump Starting

1. The booster battery must be a 12 volt type. If a vehicle is used for jump starting, it must have a negative ground system.

2. When connecting the jumper cables, connect the positive cable to the positive battery post, then connect the negative cable to the negative battery post.

7.8 DRIVE BELTS

All drive belts are spring loaded and self-tensioning, however after the first 2, 4, 8 and 10 hours of operation, the belts should be checked for proper alignment and wear. Thereafter, check the belts after every 40 hours of operation or weekly, whichever occurs first.

-NOTE-
If you experience frequent belt wear or breakage, see your authorized Scag Dealer for belt adjustment.

7.9 CUTTER BLADES

A. Blade Inspection

1. Remove the ignition key before servicing the blades.

2. Raise the mower deck to the highest position. Place the lanyard pin in the highest cutting height positon to prevent the cutter deck from falling.

⚠WARNING:
Always wear proper hand and eye protection when working with cutter blades.

3. Check the cutter blades for straightness. If the cutter blades appear bent, they will need to be replaced.

⚠WARNING:
Do not attempt to straighten a bent blade, and never weld a broken or cracked blade. Always replace it with a new blade to assure safety.

4. If a blade cutting edge is dull or nicked, it should be sharpened. Remove the blades for sharpening. See "Blade Replacement."

-NOTE-
Keep the blades sharp. Cutting with dull blades not only yields a poor mowing job, but slows the cutting speed of the mower and causes extra wear on the engine and the blade drive.

B. Blade Sharpening

-NOTE-
If possible, use a file to sharpen the blade. Using a wheel grinder may burn the blade.

-NOTE-
DO NOT sharpen the blades beyond 1/3 of the width of the blade.

1. Sharpen the cutting edge at the same bevel as the original (See Figure 7-9). Sharpen only the top of the cutting edge to maintain sharpness.

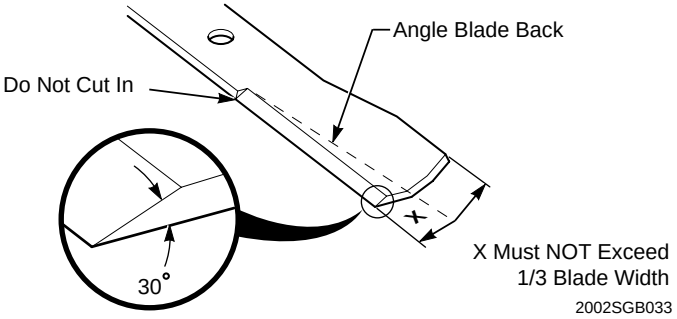


Figure 7-9 Blade Sharpening

2. Check the balance of the blade. If the blades are out of balance, vibration and premature wear can occur. See your authorized Scag dealer for blade balancing or special tools, if you choose to balance your own blades.

C. Blade Replacement

⚠WARNING:
Always wear proper hand and eye protection when working with cutter blades.

1. Remove the ignition key before replacing the blades.

2. Raise the mower deck to the highest position. Place the lanyard pin in the highest cutting height positon to prevent the cutter deck from falling.

3. Secure the cutter blades to prevent them from rotating, (Use the optional Blade Buddy tool, P/N 9212, to assist in securing the cutter blades), remove the nut from the blade attaching bolt. Remove the cutter blade, bolt and spacer from the spindle shaft. (Figure 7-10).

-NOTE-
The front of the machine will have to be raised slightly to remove the blade bolt from the cutter spindle.

4. To install the new cutter blade, put the flat washer onto the blade bolt and slide the bolt into the hole in the cutter blade.

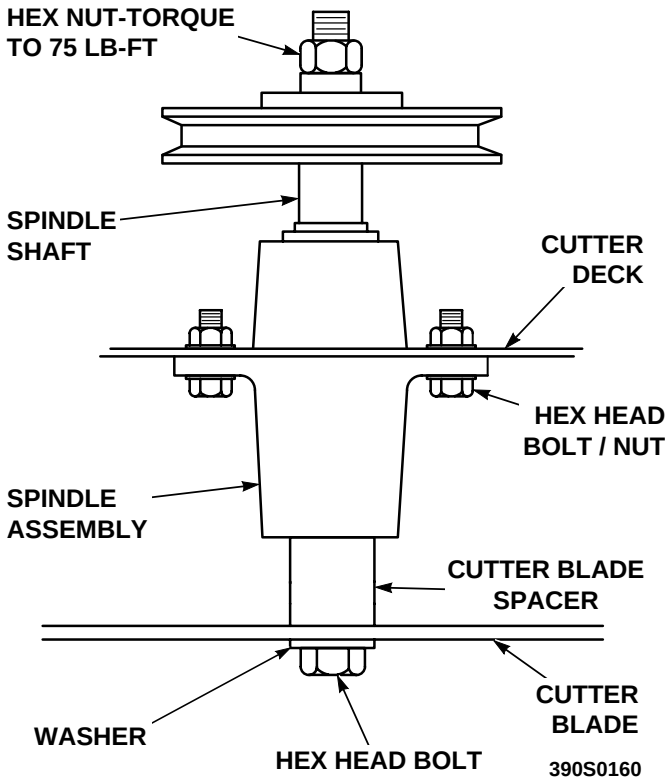


Figure 7-10 Blade Replacement

-NOTE-
Be sure that the blade is installed with the lift wing toward the top.

5. Install the spacer onto the blade bolt and insert the bolt into the cutter spindle shaft.

6. Install the hex nut to the blade bolt at the top of the cutter spindle. Secure the blades from rotating and torque to 75 ft-lbs. (See Figure 7-10)

7.10 TIRES

Check the tire pressures after every 8 hours of operation or daily.

Caster Wheels ..... 25 PSI
Drive Wheels ..... 8 PSI

7.11 BODY, DECK, AND UPHOLSTERY

⚠CAUTION:
Do not wash any portion of the equipment while it is hot. Do not wash the engine; use compressed air.

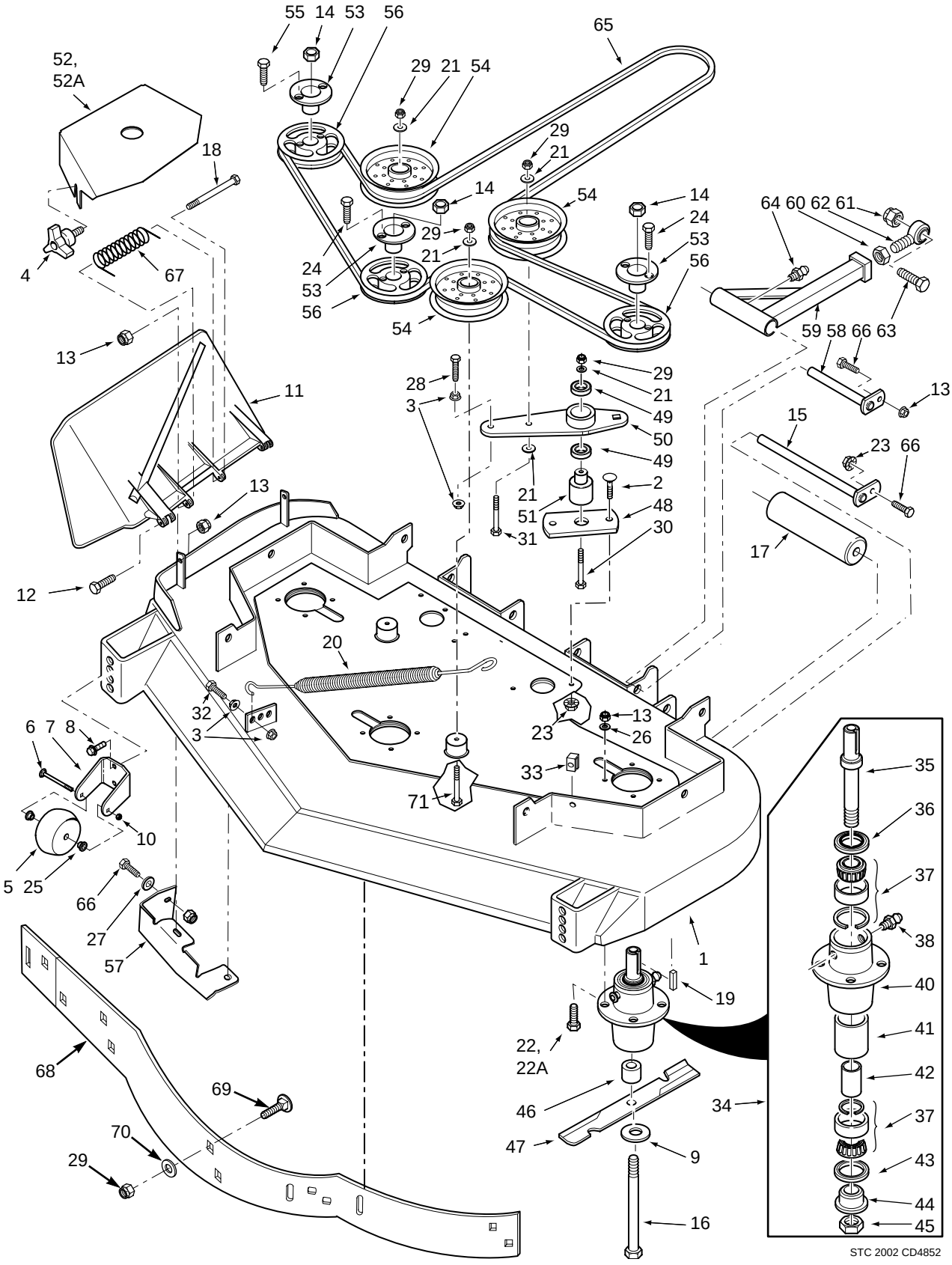
1. After each use, wash the mower and cutter deck. Use cold water and automotive cleaners. Do not use pressure cleaners.

2. Do not spray electrical components.

3. Use a mild soap solution or a vinyl/rubber cleaner to clean the seat.

4. Repair damaged metal surfaces using Scag touch-up paint available from your authorized Scag dealer. Wax the mower for maximum paint protection.

48A"& 52A" CUTTER DECKS

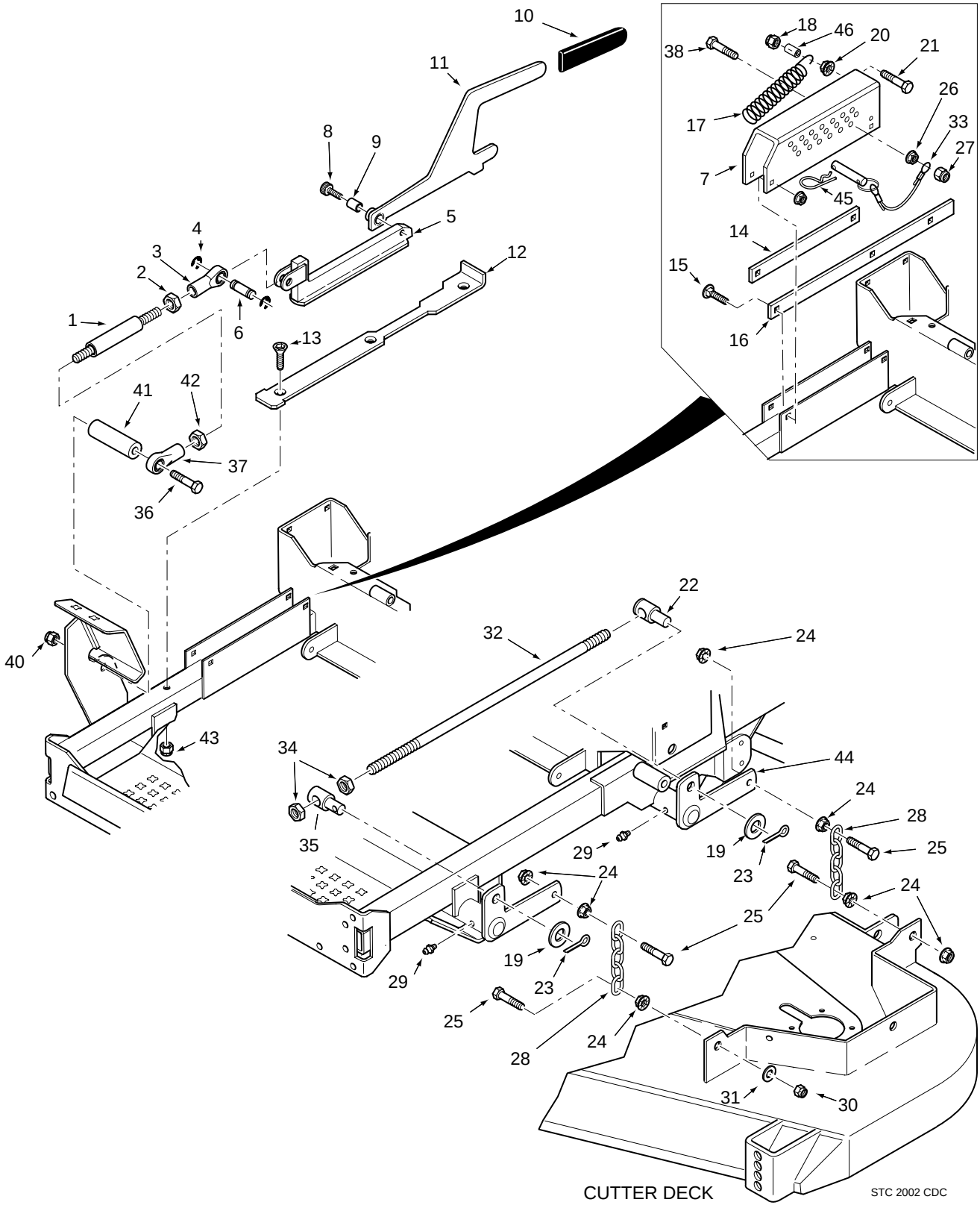


48A"& 52A" CUTTER DECKS

Ref. No.	Part No.	Description	48	52
1	461491	Cutter Deck Advantage	x	
	461500	Cutter Deck Advantage		x
2	04003-04	Bolt, Carr. 5/16-18 x 1"	x	x
3	04019-04	Nut, 3/8-16 Serrated Flange	x	x
4	481625-01	Wing Nut, 3/8-16	x	x
5	481632	Anti-Scalp Wheel	x	x
6	04003-26	Bolt, Carriage 3/8-16 x 4"	x	x
7	422478	Bracket, Anti-Scalp Wheel	x	x
8	04017-27	Bolt, Serrated Flange 3/8-16 x 1"	x	x
9	04043-06	Flatwasher, 5/8" Hardened	x	x
10	04021-05	Locknut, 3/8-16 Center Lock	x	x
11	461295	Discharge Chute	x	x
12	04001-11	Bolt, Hex Head 5/16-18 x 1-1/2", Rear	x	x
	04001-12	Bolt, Hex Head 5/16-18 x 1-3/4", Front	x	x
13	04021-10	Nut, Elastic Stop 5/16-18	x	x
14	04020-09	Nut, 5/8-11 UNC	x	x
15	45944	Shaft, Roller	x	x
16	04001-41	Bolt, Hex Head 5/8-11 x 9-1/2"	x	x
17	48038	Roller, Rear	x	x
18	04001-154	Bolt, Hex Head 5/16-18 x 4-3/4"	x	x
19	04063-08	Key, 1/4 x 1/4 x 2"	x	x
20	482718	Spring, Idler	x	x
21	04043-04	Flatwasher, 3/8"	x	x
22	04001-11	Bolt, Hex Head 5/16-18 x 1-1/2"	x	x
22A	04001-12	Bolt, Hex Head 5/16-18 x 1-3/4"	x	x
23	04019-03	Nut, Serrated Flange 5/16-18	x	x
24	04001-01	Bolt, Hex Head 1/2-20 x 3/4"	x	x
25	48100-15	Bushing, .376 ID Oilite	x	x
26	04030-03	Lockwasher 5/16"	x	x
27	04040-15	Flatwasher 5/16"	x	x
28	04001-136	Bolt, 3/8-16 x 1-1/2" Grade 8	x	x
29	04021-09	Nut, Elastic Stop 3/8-16	x	x
30	04001-31	Bolt, Hex Head 3/8-16 x 2-1/2"	x	x
31	04001-62	Bolt, Hex Head 3/8-16 x 3.25"	x	x
32	04001-136	Bolt, Hex Head 3/8-16 x 1-1/2 Grade 8	x	x
33	04110-03	U-Nut, 3/8-16	x	x
34	46631	Spindle Assembly	x	x
35	43298	Shaft, Spindle	x	x
36	481024	Seal Upper	x	x
37	481022	Bearing Assembly	x	x
38	48114-04	Grease Fitting	x	x
39	48677	Valve, Grease Relief	x	x
40	43294	Housing, Spindle	x	x
41	43312	Spacer, Outside	x	x
42	43296	Spacer, Inside	x	x
43	481025	Seal, Lower	x	x
44	43297	Bushing, Bottom	x	x
45	481035	Nut, Special 1-1/16 - 18	x	x
46	43590	Spacer, Spindle	x	x
47	482461	Cutter Blade 16.5"	x	
	482462	Cutter Blade 18"		x
48	422713	Pivot, Idler Base	x	x
49	48224	Bearing	x	x
50	461529	Idler Arm Assy.	x	x
51	43503	Idler Pivot	x	x
52	423604	Belt Cover LH (48A)	x	
52A	423605	Belt Cover RH (48A)	x	
52	423606	Belt Cover LH (52A)		x
52A	423607	Belt Cover RH (52A)		x
53	48926	Hub, Tapered 1-1/8" Bore	x	x
54	482416	Pulley, Idler 5.0"	x	x
55	04001-14	Bolt, Hex Head 1/4-20 x 1"	x	x
56	482148	Pulley 4.75"	x	
	481435	Pulley 5.35"		x
57	422599	Turbo Baffle, Bolt On	x	
	422600	Turbo Baffle Bolt On		x
58	451240	Push Arm Shaft	x	x
59	461516	Push Arm (Includes 64,60,62)	x	x
60	04020-16	Nut, 5/8-18 UNF	x	x
61	04021-13	Nut, Elastic Stop 5/8-11	x	x
62	48763	Rod End, 5/8 Male RH Thread	x	x
63	04001-79	Bolt, Hex Head 5/8-11 x 4-1/2"	x	x
64	48114-04	Grease Fitting, 90 Degree	x	x
65	482529	Belt, Cutter Deck Drive (48A")	x	
	482530	Belt, Cutter Deck Drive (52A")		x
66	04001-09	Bolt, Hex Head 5/16-18 x 1"	x	x
67	482245	Spring, Discharge Chute	x	x
68	451507	Baffle Weldment, 48A	x	
	451508	Baffle Weldment, 52A		x
69	04003-23	Bolt, Carriage 3/8-16 x 1"	x	x
70	04041-07	Flatwasher, 3/8-.391 x .938 x .105	x	x
71	04001-51	Bolt, Hex Head 3/8-16 x 3-3/4"	x	x

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

CUTTER DECK CONTROLS 48A” & 52A" DECKS

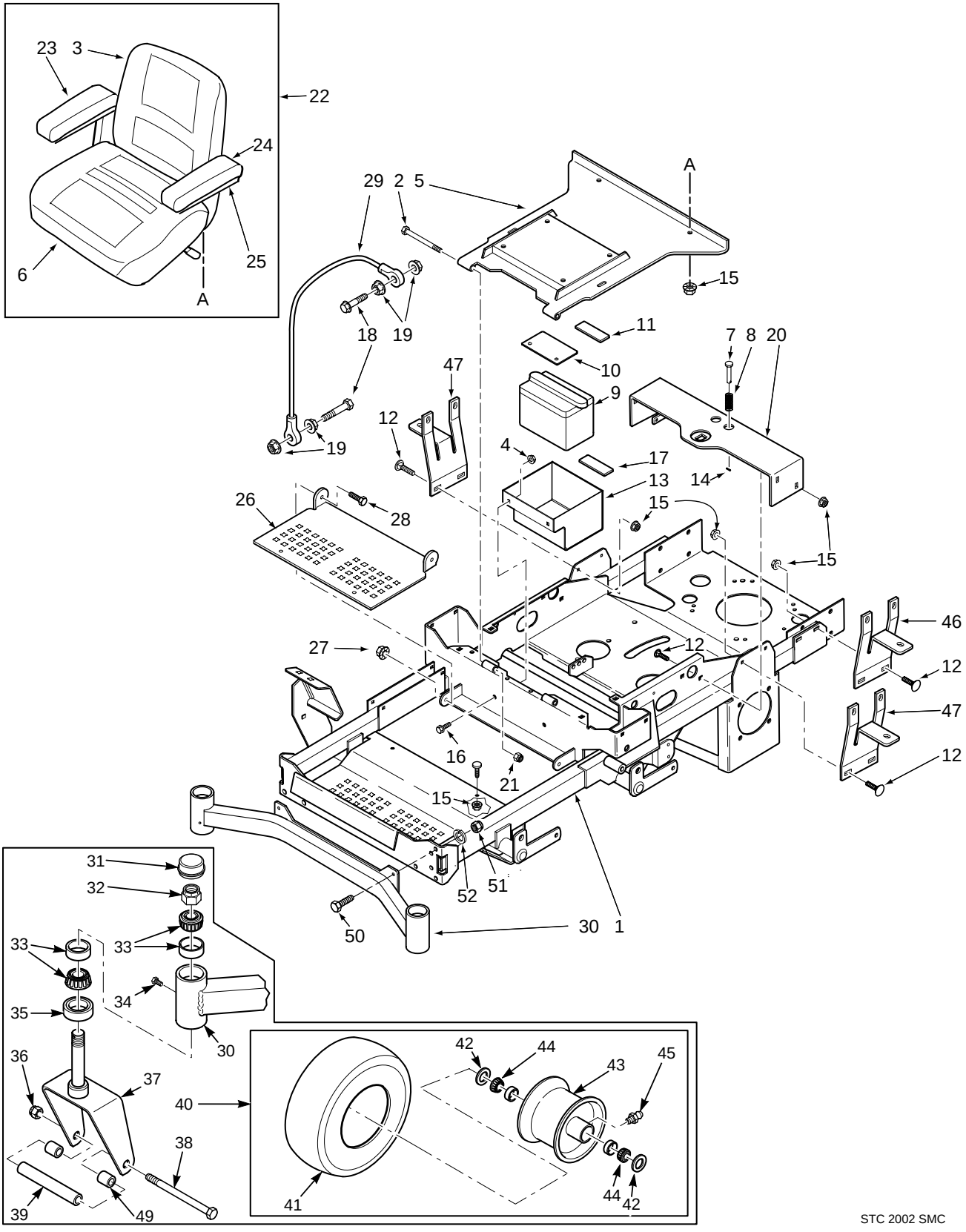


CUTTER DECK CONTROLS 48A" & 52A" DECKS

Ref. No.	Part No.	Description	48A"	52A
1	482624	Rod, Deck Lift Linkage	x	x
2	04020-28	Nut, Jam 1/2-20 LH Thread	x	x
3	481766	Rod End, 1/2-20 Female Thread	x	x
4	04050-10	Retaining Ring, 1/2" External "E"	x	x
5	482429	Slide, Deck Height Adjust	x	x
6	43487	Pin, Deck Lift	x	x
7	423463	Bracket, Cutting Height Adjustment	x	x
8	04009-02	Bolt, Shoulder 1/2-3/4"	x	x
9	48100-14	Bushing .502 ID	x	x
10	481428	Grip, Deck Latch Lever	x	x
11	461478	Lever, Deck Latch (Includes 9 &10)	x	x
12	422346	Slide, Cutting Height	x	x
13	04014-03	Screw, Cap 5/16-18 x 3" FHHS	x	x
14	422381	Guide, Short	x	x
15	04003-04	Bolt, Carriage 5/16-18 x 1"	x	x
16	422380	Guide, Long	x	x
17	481598	Spring, Helper	x	x
18	04021-05	Nut, 3/8-16 Center Lock	x	x
19	04040-09	Flatwasher, 5/8-.656 x 1.312 x .095	x	x
20	04019-04	Nut, 3/8-16 Serr. Flange	x	x
21	04001-32	Bolt, Hex Head 3/8-16 x 1-1/4"	x	x
22	43611	Swivel Joint LH	x	x
23	04061-07	Cotter Pin, 3/16 x 1"	x	x
24	04019-04	Nut, Serr. Flange 3/8-16	x	x
25	04001-20	Bolt, Hex Head 3/8-16 x 1-1/2"	x	x
26	04019-04	Nut, Serr. Flange 3/8-16	x	x
27	04021-09	Nut, Elastic Stop 3/8-16	x	x
28	48540	Chain	x	x
29	48114-04	Grease Fitting, 1/4-28 Self Tap	x	x
30	04021-09	Nut, Elastic Stop 3/8-16	x	x
31	04041-07	Flatwasher, 3/8-.391 x .938 x .105	x	x
32	04004-45	Stud, 1/2-13 x 20"	x	x
33	481547	Lanyard Pin	x	x
34	04020-09	Nut, 5/8-11 UNC	x	x
35	43612	Swivel Joint RH	x	x
36	04001-155	Bolt, Hex Head 1/2-13 x 5"	x	x
37	481765	Rod End, 1/2-20 Female RH Thread	x	x
38	04001-77	Bolt, Hex Head 3/8-16 x 3-1/2"	x	x
39	43572	Spacer	x	x
40	04021-02	Lock Nut, 1/4-20	x	x
41	43557	Spacer	x	x
42	04020-27	Nut, 1/2-20 UNF-2B	x	x
43	04021-10	Nut, Elastic Stop 5/16-18	x	x
44	45904	Lift Bellcrank Weldment, LH Rear	x	x
	45905	Lift Bellcrank Weldment, RH Rear	x	x
	04041-14	Flatwasher, 1.0-1.062 x 1.5 x .048	x	x
	04050-08	Retaining Ring, 1" ext.	x	x
45	04062-04	Hair Pin Cotter, .177 x 3-1/4"	x	x

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

SHEET METAL COMPONENTS



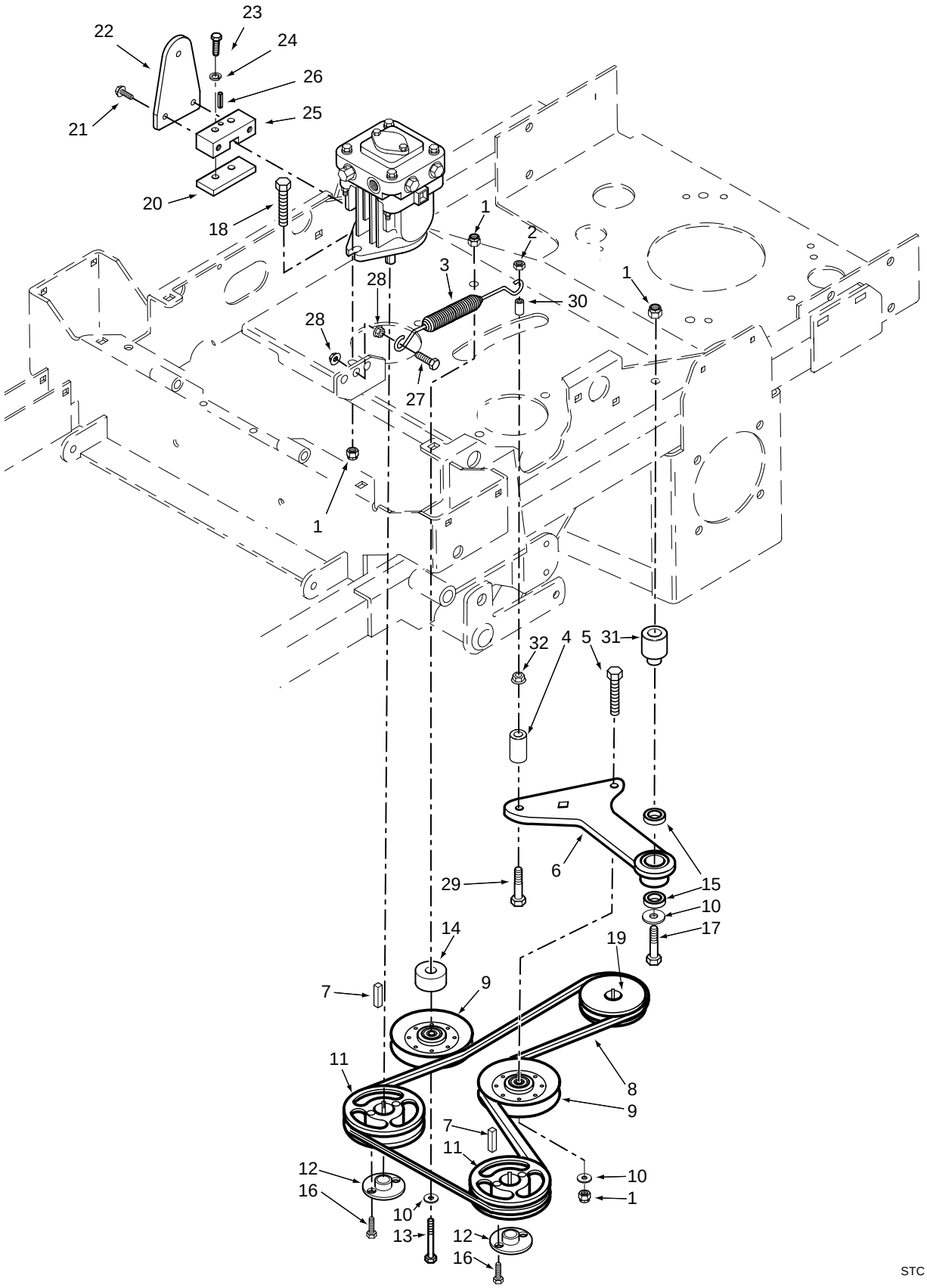
STC 2002 SMC

SHEET METAL COMPONENTS

Ref. No.	Part No.	Description
1	461522	Main Frame Assembly w/decals
2	04001-73	Bolt, Hex Head 5/16-18 x 3-3/4”
3	482632	Cushion, Back
4	04019-04	Nut, Serr. Flange 3/8-16
5	451461	Plate, Seat Mounting
6	482111	Cushion, Lower Seat
7	43462	Pin Retainer, Spring
8	481389	Spring
9	48015	Battery
10	423571	Battery Cover
11	482553	Battery Hold Down Pad
12	04003-12	Bolt, Carr. 5/16-18 x 3/4”
13	423556	Battery Box
14	04060-01	Roll Pin, Spring 5/32 x 3/4”
15	04019-03	Nut, Serr. Flange 5/16-18
16	04001-19	Bolt, Hex Head 3/8-16 x 1”
17	482552	Pad, Rubber
18	04001-59	Bolt, Hex Head 1/4-20 x 1-1/4”
19	04019-02	Nut, Serr. Flange 1/4-20
20	451462	Seat Base Support
21	04021-10	Nut, Elastic Stop 5/16-18
22	482551	Seat Assembly w/ adj. rails
	482631	Seat Assembly w/out adj. rails
23	482108	Arm Pad, RH
	482110	Bracket, Armrest RH
24	482107	Arm Pad, LH
	482109	Bracket, Armrest LH
25	482183	Channel, Armrest
26	423557	Footplate
27	04021-09	Nut, Elastic Stop 3/8-16
28	04001-19	Bolt, Hex Head 3/8-16 x 1”
29	48566	Cable, Seat Stop
30	451470	Weldment, Caster Support
31	481559	Cap, Grease
32	04021-20	Nut, Elastic Stop 1.0-14
33	48668	Bearing Set
34	482028-01	Plug, 1/4-28
35	481025	Seal, 2.0” OD x 1.625” ID
36	04021-07	Nut, Elastic Stop 1/2-13
37	451471	Yoke, Front Caster Wheel
38	04001-134	Bolt, Hex Head 1/2-13 x 7-1/2”
39	43581	Sleeve
40	482503	Caster Wheel Assembly (Incl. 41 thru 45)
41	481613	Tire, 13 x 5.0-6 Smooth
42	482622	Seal
43	482625	Rim (Includes Item 45)
44	482621	Roller Bearing
45	48114-04	Fitting, Grease
46	423575	Mounting Bracket, Oil Tank
47	423630	Mounting Bracket, Fuel Tank
48	482633	Seat Pan
49	53584	Spacer, Caster Wheel
50	04001-28	Bolt, Hex Head 7/16-14 x 1-1/4”
51	04021-11	Nut, Elastic Stop 7/16-14
52	04030-05	Lockwasher, 7/16

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

DRIVE SYSTEM COMPONENTS



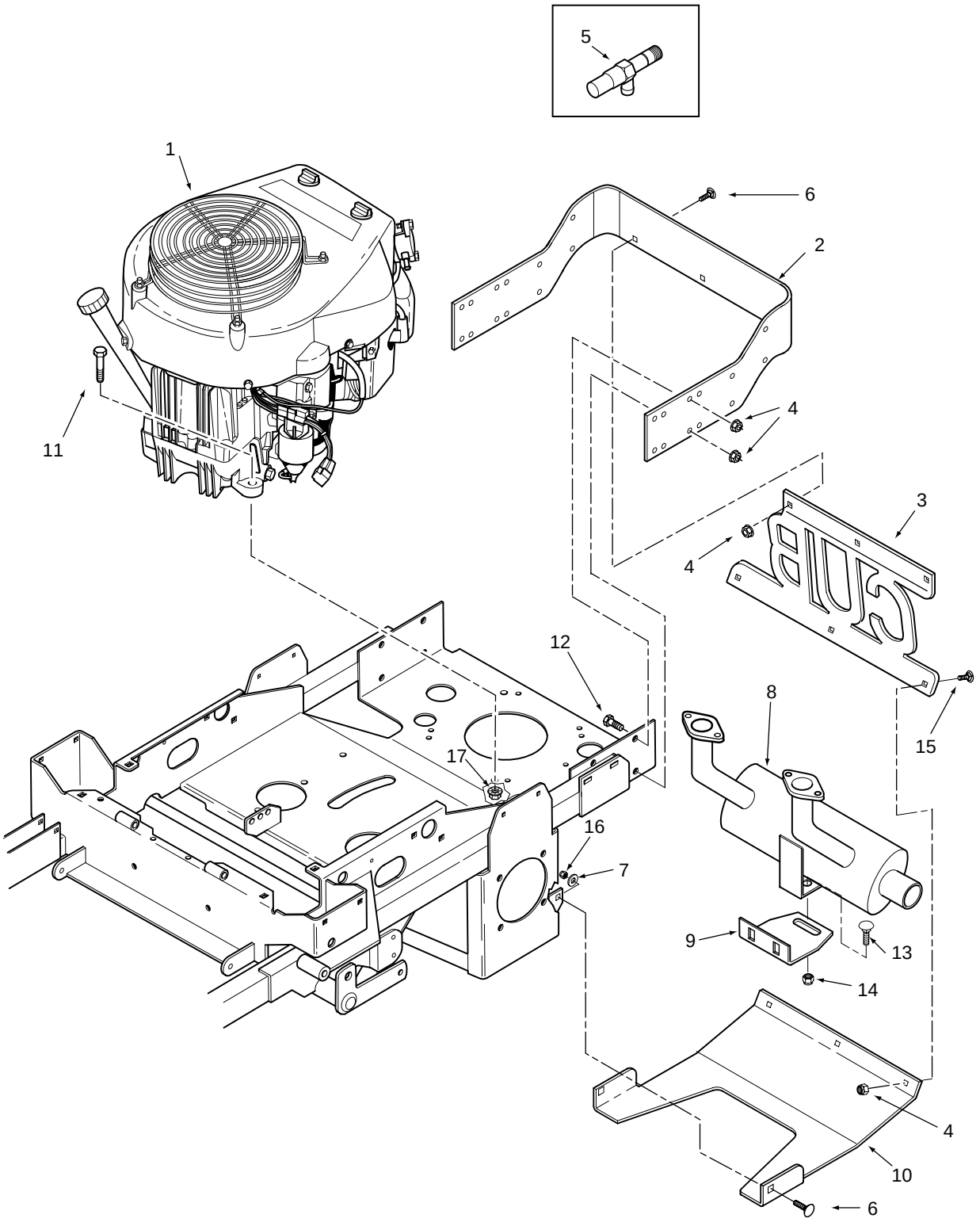
STC 2002 DSC

DRIVE SYSTEM COMPONENTS

Ref. No.	Part No.	Description
1	04021-09	Nut, Elastic Stop 3/8-16
2	04021-05	Nut, Center Lock 3/8-16
3	461706	Spring
4	43572	Spacer
5	04001-46	Bolt, Hex Head 3/8-16 x 2-1/4”
6	461523	Idler Arm Assy., Pump Drive
7	04063-14	Key, 5 x 5 x 25mm
8	482531	Belt, Transmission
9	481048	Pulley
10	04043-04	Flatwasher, 3/8-.391 x .938 x .105
11	482536	Pulley,
12	482085	Hub, Tapered, 15mm Bore
13	04001-31	Bolt, 3/8-16 x 2-1/2”
14	43286	Spacer, Idler
15	48224	Bearing
16	04001-01	Bolt, Hex Head 1/4-20 x 3/4”
17	04001-31	Bolt, Hex Head 3/8-16 x 2-1/2”
18	04001-20	Bolt, Hex Head 3/8-16 x 1-1/2”
19	482487	Pulley, 5.45 OD x 1.125 Bore
20	421203	Clamp Plate
21	04017-05	Hex Head Capscrew, 1/4-20 x 3/4”
22	422969	Control Lever, Pump
23	04017-05	Hex Head Capscrew, 1/4-20 x 3/4”
24	04030-02	Lockwasher, 1/4”
25	48829	Block, Pump Control
26	04060-06	Roll Pin
27	04001-136	Bolt, Hex Head 3/8-16 x 1-1/2” Grade 8
28	04019-04	Nut, Serr. Flange 3/8-16
29	04001-139	Bolt, Hex Head 3/8-16 x 2-1/2” Grade 8
30	43212	Spacer
31	43503	Pivot, Idler

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

ENGINE AND ATTACHING PARTS



STC 2002 EAPKA

ENGINE AND ATTACHING PARTS

Ref. No.	Part No.	Description	19KA	20CV	21KA	23KA
1	482488	Engine, Kawasaki (FH601V-AS21)	x			
	482492	Engine, Kohler (PS-65584)		x		
	482489	Engine, Kawasaki (FH641V-AS18)			x	
	482490	Engine, Kawasaki (FH680V-AS19)				x
2	423554	Bumper, Rear	x	x	x	x
3	423483	Shield, Rear	x	x	x	x
4	04019-04	Nut, Serr. Flange 3/8-16	x	x	x	x
5	482510	Extension, Oil Drain 2.3”		x		
	482349	Extension, Oil Drain 4”	x		x	x
6	04003-23	Bolt, Carr. 3/8-16 x 1”	x	x	x	x
7	04041-07	Flatwasher, 3/8-.391 x .938 x .105	x	x	x	x
8	482537	Muffler	x		x	x
	482538	Muffler		x		
9	423572	Bracket, Muffler	x	x	x	x
10	423555	Plate, Skid	x	x	x	x
11	04001-11	Bolt, Hex Head 5/16-18 x 1-1/2”	x	x	x	x
12	04001-19	Bolt, Hex Head 3/8-16 x 1”	x	x	x	x
13	04003-12	Bolt, Hex Head 5/16-18 x 3/4”	x	x	x	x
14	04019-03	Nut, Serr. Flange 5/16-18	x	x	x	x
15	04003-31	Bolt, Carr. 3/8-16 x 3/4”	x	x	x	x
16	04021-09	Nut, Elastic Stop 3/8-16	x	x	x	x
17	04019-03	Nut, Serr. Flange 5/16-18	x	x	x	x

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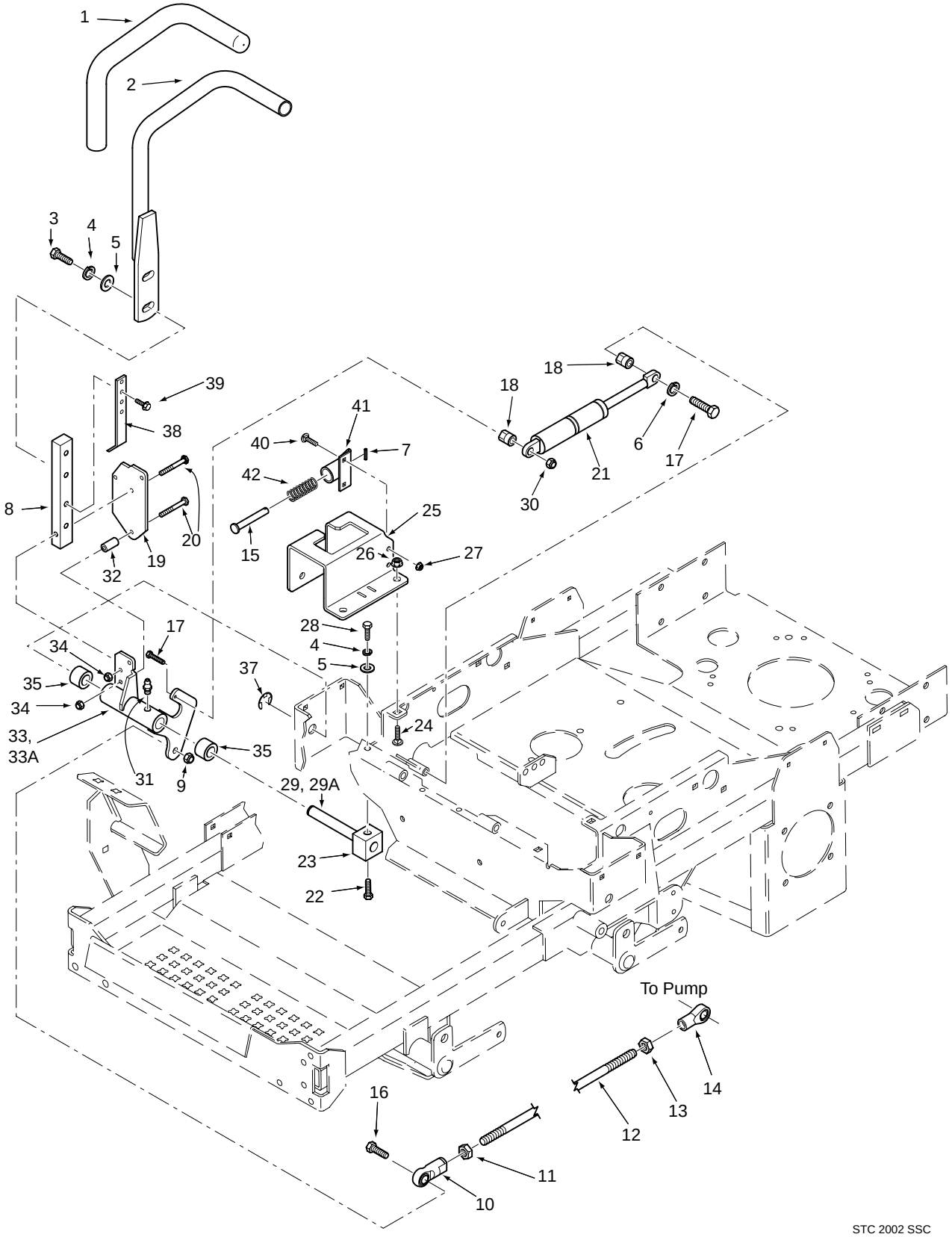
STEERING COMPONENTS



STEERING COMPONENTS

Ref. No.	Part No.	Description
1	482340	Grip, Control Lever
2	461386	Handle Bar (Includes item 1)
3	04001-32	Bolt, Hex Head 3/8-16 x 1-1/4”
4	04030-04	Lock Washer, 3/8”
5	04041-07	Flatwasher, 3/8-.391 x .938 x .105
6		Washer
7	04060-01	Roll Pin, Spring 5/32 x 3/4”
8	422372	Bar, Control Lever
9	04021-09	Nut, Elastic Stop 3/8-16
10	482330	Rod End, 3/8-24 RH Female
11	04020-14	Nut, 3/8-24 RH Thread
12	482623	Rod, Pump Control Linkage
13	04020-17	Nut, 3/8-24 UNF-2B LH Thread
14	482331	Rod End, 3/8-24 LH Thread
15	43477	Pin Retainer
16	04001-20	Bolt, Hex Head 3/8-16 x 1-1/2”
17	04001-12	Bolt, Hex Head 5/16-18 x 1-3/4”
18	43602	Spacer, Pump Dampener
19	423599	Plate, Control Lever
20	04001-17	Bolt, Hex Head 5/16-18 x 2”
21	482452	Gas Damper
22	04001-19	Bolt, Hex Head 3/8-16 x 1”
23	482099	Block, Clamping
24	04003-12	Bolt, Carriage, 5/16-18 x 3/4”
25	461525	Control Plate - LH (Includes Decal)
	461526	Control Plate - RH (Includes Decal)
26	04019-03	Nut, Serr., Flange, 5/16-18
27	04021-08	Nut, Elastic Stop 1/4-20
28	04001-18	Bolt, Hex Head 3/8-16 x 3/4”
29	43616	Shaft, Steering Control
29A	482099	Block, Clamp
30	04021-10	Nut, Elastic Stop 5/16-18
31	48114-04	Grease Fitting, 1/4-28 Self Tap
32	43559	Spacer, Control
33	49574	Control Lever Assy RH (Includes 31 & 35)
	49573	Control Lever Assy LH (Includes 31 & 35)
34	04021-10	Nut, Elastic Stop 5/16-18
35	48100-06	Bushing
36	04041-08	Flatwasher, 1-1/4 x 49/64 x 16 Ga.
37	04050-02	Retaining Ring, 3/4” Ext.
38	423057	Bracket, Switch Actuator
39	04017-16	Bolt, Hex Serr. Flange 5/16-18 x 3/4”
40	04003-02	Bolt, Carr. 1/4-20 x 3/4”
41	45918	Bracket, Control Return
42	481389	Spring
43	43477	Pin Retainer

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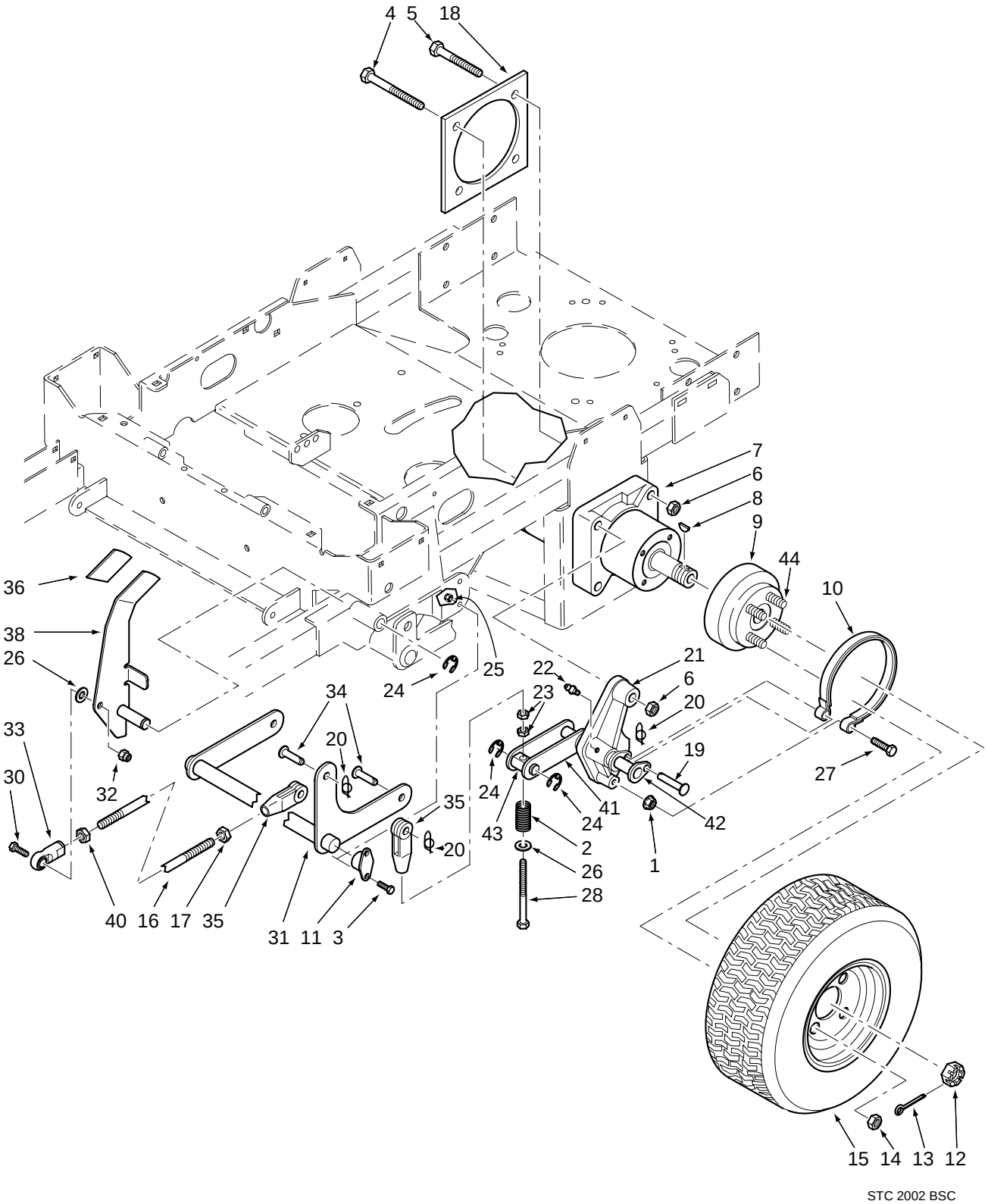
BRAKE COMPONENTS

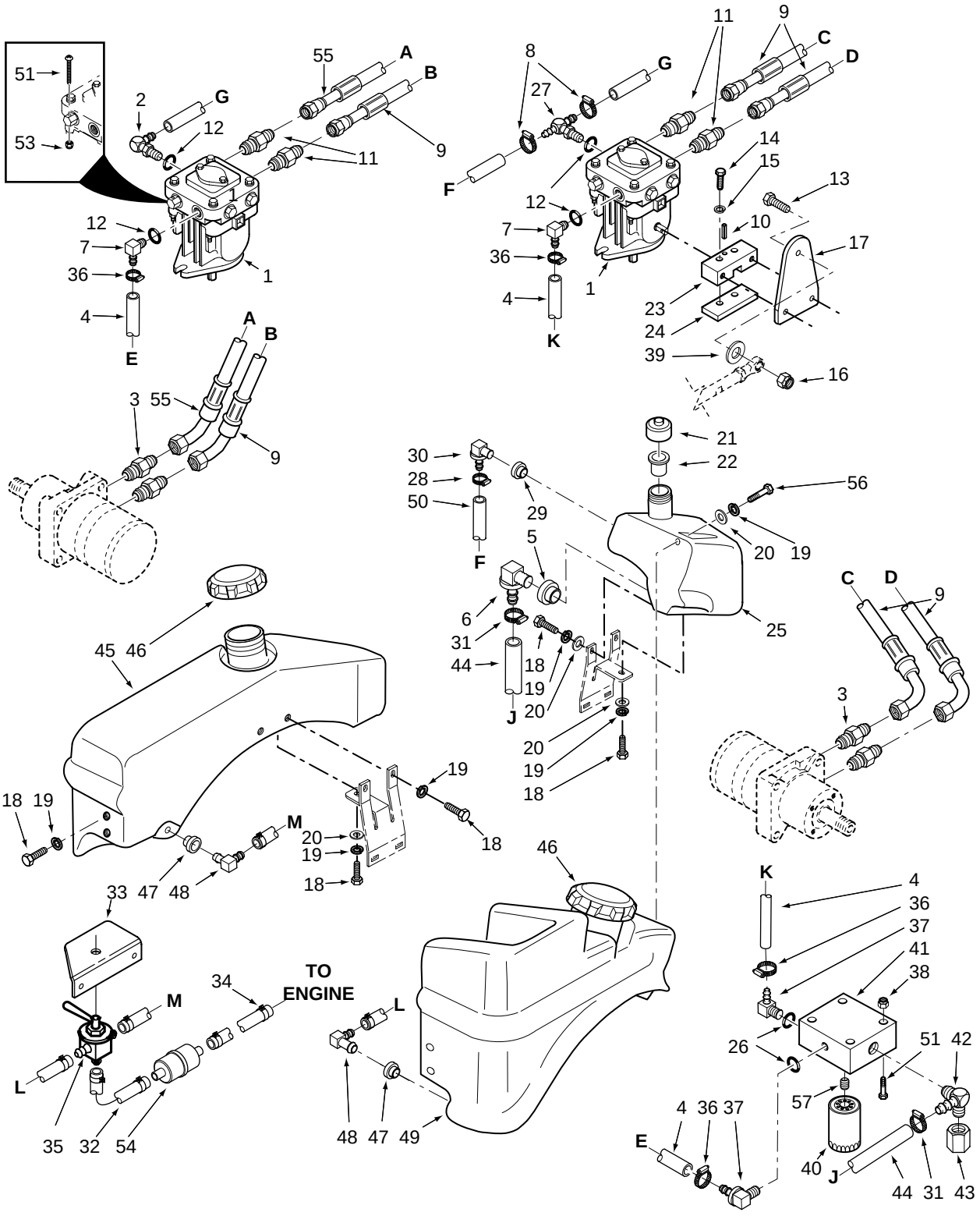


BRAKE COMPONENTS

Ref. No.	Part No.	Description
1	04019-04	Nut, Serr. Flange 3/8-16
2	48807	Spring
3	04001-08	Bolt, Hex Head 5/16-18 x 3/4”
4	04001-163	Bolt, Hex Head 1/2-13 x 3-3/4”
5	04001-52	Bolt, Hex Head 1/2-13 x 2-1/2”
6	04021-19	Nut, 1/2-13 Center Lock
7	481529	Wheel Motor Ross
8	04063-25	Key, Woodruff 5/16 x 1”
9	461438	Wheel Hub Assembly
10	481601	Brake Band Assembly
11	482061	Bushing, Self Align
12	48680	Nut, Hex Castle 1.0-20 UNEF
13	04061-06	Cotter Pin, 9/64 x 1-1/2”
14	04028-02	Lug Nut, 1/2-20
15	482044	(48”) Wheel Assembly 23 x 9.5 -12
	481659	(48”) Rim
	482413	(52”) Wheel Assembly 23 x 9.5 -12
	482414	(52”) Rim
	482194	(48” & 52”) Tire 23 x 9.5 - 12
16	04004-46	Brake Rod Stud, 3/8-24 x 8.125
17	04020-14	Nut, 3/8-24 UNF
18	423279	Plate Weldment, Motor Backing
19	04064-16	Clevis Pin, 3/8 x 1.93”
20	04069-01	Pin, Rue Cotter 3/8 Dia.
21	461471	Brake Linkage LH
	461472	Brake Linkage RH
22	48114-04	Grease Fitting, 1/4-28
23	04020-25	Nut, 3/8-24 UNF
24	04050-01	Retaining Ring, .625 Ext.
25	04021-10	Nut, Elastic Stop 5/16-18
26	04041-07	Flatwasher, 3/8-.391 x .938 x .105
27	04001-31	Bolt, Hex Head 3/8-16 x 2-1/2”
28	04001-166	Bolt, Hex Head 3/8-24 x 3-3/4”
29	04061-02	Cotter Pin, 3/32 x 3/4”
30	04001-20	Bolt, Hex Head 3/8-16 x 1-1/2”
31	451463	Brake Shaft
32	04021-09	Nut, Elastic Stop 3/8-16
33	48544	Rod End, 3/8-24 LH Thread
34	04064-02	Clevis Pin, 3/8 x 1.06
35	48343-04	Clevis, 3/8-24
36	482102	Grip, Brake Lever
37	04019-04	Nut, Serr. Flange 3/8-16
38	461509	Brake Lever (includes item 36)
39	04001-22	Bolt, Hex Head 3/8-16 x 2-3/4”
40	04020-17	Nut, 3/8-24 UNF-2B LH Thread
41	422483	Lever, Brake
42	45974	Shaft Weldment, Pivot
43	43495	Pin, Pivot
44	04008-01	Bolt, Serr. Flange 1/2-20 x 4.563”

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

FUEL AND HYDRAULIC SYSTEM



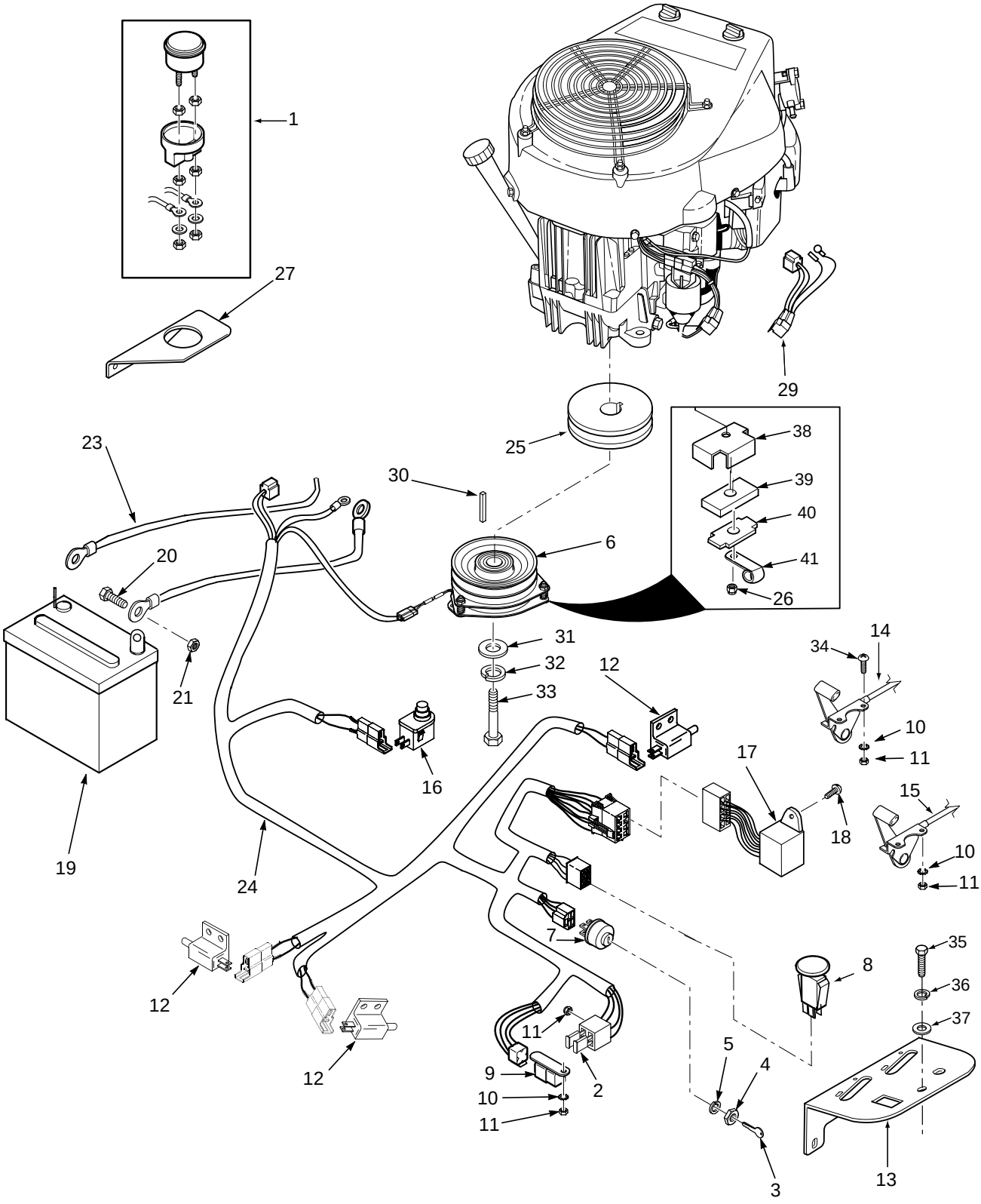
FUEL AND HYDRAULIC SYSTEM

Ref. No.	Part No.	Description
1	482643	Pump, BDP-10A-316 (L.H.)
	482644	Pump, BDP-10A-419 (R.H.)
2	482266-01	Elbow, 90 Degree 9/16 O-Ring x 3/8 Hose
3	48572-02	Fitting, 1/2" JIC x 5/8 O-Ring
4	48811	Hose, 3/8 Pushlock (Specify length)
5	482573	Bushing
6	482574	Fitting
7	482266-01	Elbow, 90 Degree 9/16 O-Ring x 3/8 Hose
8	48136-13	Hose Clamp, .69 Dia.
9	482605	Hose Assembly
10	04060-06	Roll Pin
11	48572-04	Fitting, 1/2" JIC x 1/2" O-Ring
12	48603-06	O-Ring
13	04001-20	Bolt, Hex Head 3/8-16 x 1-1/2"
14	04017-07	Bolt, Hex Head 1/4-20 x 1-1/4"
15	04030-02	Lockwasher
16	04021-09	Nut, Elastic Stop 3/8-16
17	422969	Control Lever
18	04001-08	Bolt, Hex Head 5/16-18 x 3/4"
19	04030-03	Lockwasher, 5/16
20	04040-15	Flatwasher, 5/16-.375 x .875 x .083
21	481164	Cap, Hydraulic Tank
22	481507	Insert, Filler Neck
23	48829	Control Block
24	421203	Clamp Plate
25	461479	Hydraulic Tank Assembly w/fittings
26	48603-06	O-Ring
27	482277	Tee Fitting, O-Ring to Barb
28	48136-13	Clamp, .69 Max. / .25 Min. Dia.
29	482571	Bushing
30	482572	Elbow, 0.38 Hose
31	48136-13	Clamp
32	48058	Fuel Hose, 1/4 ID
33	423573	Bracket Fuel Valve
34	48059-01	Clamp, Fuel Hose 1/4 Hose ID
35	482212	Valve, Fuel Shutoff
36	48136-13	Clamp, .69 Max. / .25 Min. Dia.
37	482266-01	Elbow, 1/4 NTP x 3/8 Hose Barb
38	04019-03	Nut, Serr. Flange 5/16-18
39	04041-07	Flatwasher, 3/8-.391 x .938 x .105
40	48462-01	Oil Filter
41	482556	Filter Head Assembly
42	482539	Fitting, Tee Special
43	48571-02	Cap, 3/4-16 JIC
44	482557	Hose, Filter Inlet
45	461477	Fuel Tank RH
46	482547	Cap, Fuel Tank
47	48309	Tank Bushing
48	48939	Elbow, 90 Degree
49	461476	Fuel Tank LH
50	48811	Hose, 3/8 Pushlock 15" Long
51	04001-53	Bolt, Hex Head 5/16-18 x 2-1/2"
52	04010-10	Screw, 1/4-20 x 2"
53	04021-08	Nut, Elastic Stop 1/4-20
54	**	Fuel Filter
55	482605	Hose Assembly
56	04001-11	Bolt, Hec Head 5/16-18 x 1-1/2
57	48750	Nipple, Oil Filter 1.0-12 UNF-2A x 1-1/4"

* Common hardware which can be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

** Available through the individual engine manufacturer.

ELECTRICAL SYSTEM (KAWASAKI & KOHLER)

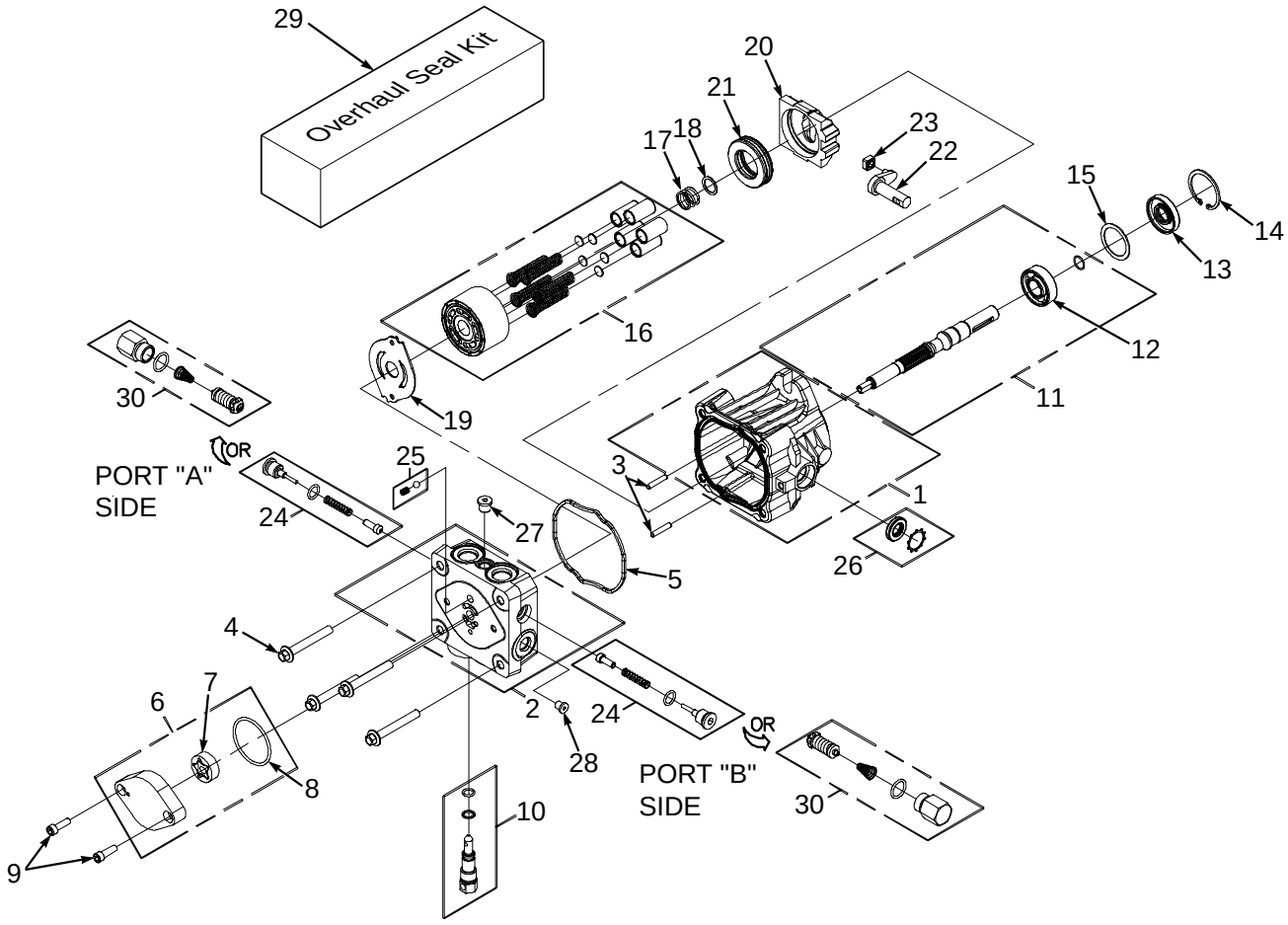


STC 2002 ESKA

ELECTRICAL SYSTEM (KAWASAKI & KOHLER)

Ref. No.	Part No.	Description
1	48023	Hourmeter
2	48298	Fuse, 20 amp
3	48017-02	Key, Ignition
4	48017-04	Nut, Hex 5/8-32
5	48017-03	Lockwasher, 5/8" Internal
6	461715	Electric PTO Clutch
7	48798	Switch, Ignition
8	481687	Switch, PTO
9	48788	Relay
10	04031-01	Lock Washer, #10 External Tooth
11	04020-01	Nut, Hex #10-32
12	481637	Switch, N/O
13	461528	Panel, Instrument
14	482032	Choke & Throttle Control - Kawasaki (Qty 2)
	481544	Choke Control - Kohler (Qty 1)
15	482032	Throttle Control - Kohler (Qty 1)
16	481638	Switch, Seat
17	482313	Module, Interlock
18	04010-01	Screw, #10-32 x .5" Phillips Head
19	48015	Battery
20	04001-44	Bolt, Hex Head 1/4-20 x .5"
21	04020-02	Nut, Hex 1/4-20
22	48029-15	Cable, Battery Black (negative)
23	48029-02	Cable, Battery Red (positive)
24	482542	Wiring Harness, Main
25	482487	Pulley, 5.45 OD x 1.125 Bore
26	04021-10	Nut, Elastic Stop 5/16-18 Key
27	423643	Mounting Bracket, Hour Meter
28	04010-11	Screw, #10-32 x 1.5" Phillips Head
29	482543	Adaptor, Wiring Harness (Kawasaki only)
	482094	Adaptor, Wiring Harness (Kohler only)
30	04063-23	Key, 1/4 x 1/4 x 3-1/4"
31	04041-28	Flatwasher, 7/16-.469 x 1-3/4" x 1/4"
32	04030-05	Lockwasher, 7/16"
33	04001-101	Bolt, Hex Head 7/16-20 x 2-1/2" UNF
34	04010-12	Screw, #10-32 x 3/4"
35	04001-08	Bolt, Hex Head 5/16-18 x 3/4"
36	04030-03	Lockwasher, 5/16
37	04040-15	Flatwasher, 5/16-.375 x .875 x .083
38	422533	Backing Plate
39	481716	Rubber Pad, Clutch Stop
40	422534	Plate, Backing
41	48030-09	Clamp

HYDRAULIC PUMP ASSEMBLY



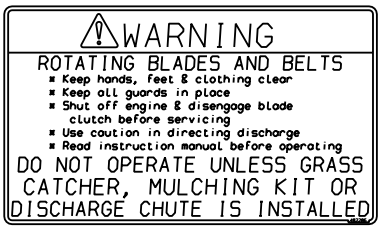
HYDRAULIC PUMP ASSEMBLY

Ref. No.	Part No.	Description
1	HG 70516	Housing Kit
2	HG 70573	End Cap Kit
3	HG 50641	Straight Headless Pin
4	HG 50969	Hex Flange Bolt, M8-1.25 x 60mm
5	HG 51232	Housing O-Ring
6	HG 2513027	Charge Pump Kit
7	HG 50273	Gerotor Assembly
8	HG 9004101-1340	O-Ring
9	HG 50095	Socket Head Screw, M6 x 1.0-20mm
10	HG 2513030	Bypass Valve Kit
11	HG 70521	Pumpshaft Kit
12	HG 50315	Ball Bearing, 17 x 40 x 12
13	HG 51161	Lip Seal
14	HG 50329	Retaining Ring
15	HG 50951	Spacer
16	HG 70331	Cylinder Block Kit
17	HG 2003014	Block Spring
18	HG 2003017	Block Thrust Washer
19	HG 51444	Valve Plate
20	HG 2003087	Swash Plate
21	HG 50551	Ball Thrust Bearing
22	HG 2003005	Trunnion Arm
23	HG 2000015	Slot Guide
24	HG 2510062	Check Valve Kit (.024” Orfice) port “A” on Left Hand Pump, port “B” on Right Hand Pump
25	HG 70403	Charge Relief Kit
26	HG 2513043	Trunnion Seal with Retainer
27	HG 9005110-4400	Straight Thread Plug
28	HG 50408	Straight Headless Pin
29	HG 70525	Overhaul Seal Kit
30	HG 70589	System Check Relief Kit, port “B” on Left Hand Pump, port “A” on Right Hand Pump

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

REPLACEMENT DECALS AND INFORMATION PLATES

1


WARNING
ROTATING BLADES AND BELTS
* Keep hands, feet & clothing clear
* Keep all guards in place
* Shut off engine & disengage blade clutch before servicing
* Use caution in directing discharge
* Read instruction manual before operating
DO NOT OPERATE UNLESS GRASS CATCHER, MULCHING KIT OR DISCHARGE CHUTE IS INSTALLED

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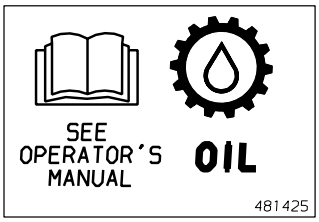

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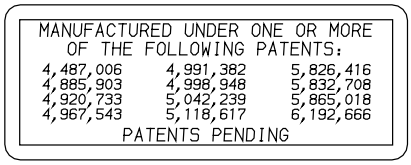

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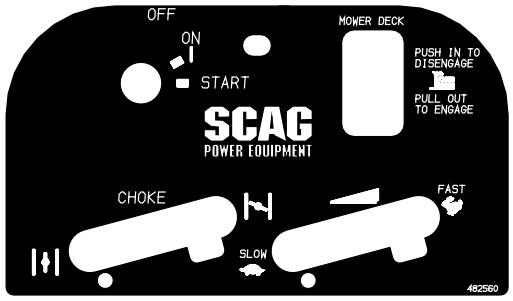

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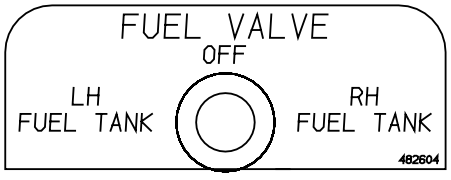

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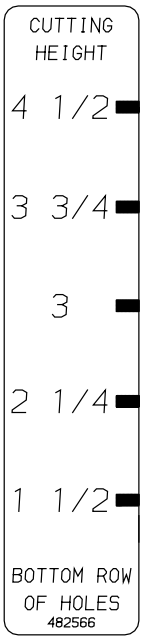

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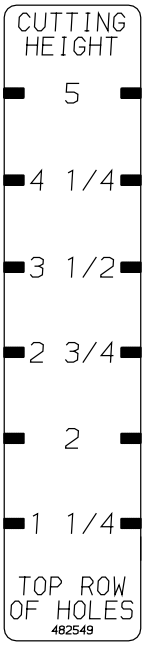

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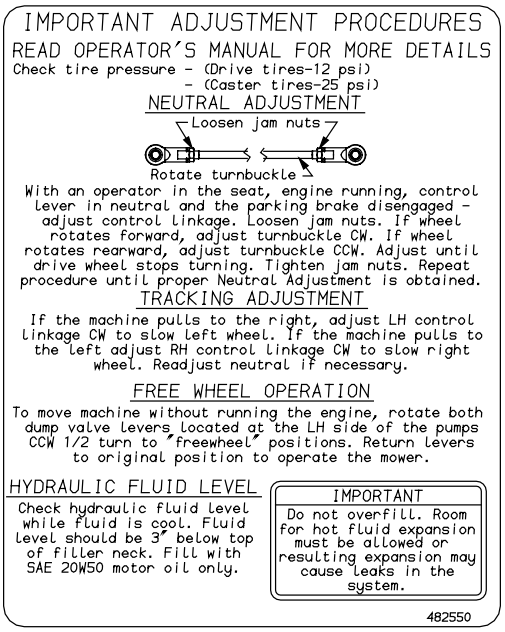
STC 2002 RDP1

REPLACEMENT DECALS AND INFORMATION PLATES

Ref. No.	Part No.	Description
1	482285	Decal, Danger-Spining Blades
2	482286	Decal, Warning-Rotating Blades
3	481953	Decal, 48A
	481954	Decal 52A
4	481425	Decal, Oil
5	48656	Decal, Patents
6	482100	Decal, Traction Control
7	481971	Decal, Heavy Duty Commercial
8	48404	Decal, Metalcraft - Made in USA
9	481039	Decal, Belt Cover
10	482560	Decal, Instrument Panel
11	482604	Decal, Fuel Valve Position
12	482566	Decal, Cutting Height Bottom Row of Holes
13	482578	Decal, Tiger Cub
14	482550	Decal, Seat Support
15	482579	Decal, Rear Bumper
16	482166	Decal, Front Footplate
17	482165	Decal, Discharge Chute
18	482549	Decal, Cutting Height Top Row of Holes


IMPORTANT ADJUSTMENT PROCEDURES
READ OPERATOR'S MANUAL FOR MORE DETAILS
Check tire pressure - (Drive tires-12 psi)
- (Caster tires-25 psi)
NEUTRAL ADJUSTMENT
Loosen jam nuts
Rotate turnbuckle
With an operator in the seat, engine running, control Lever in neutral and the parking brake disengaged - adjust control linkage. Loosen jam nuts. If wheel rotates forward, adjust turnbuckle CW. If wheel rotates rearward, adjust turnbuckle CCW. Adjust until drive wheel stops turning. Tighten jam nuts. Repeat procedure until proper Neutral Adjustment is obtained.
TRACKING ADJUSTMENT
If the machine pulls to the right, adjust LH control linkage CW to slow left wheel. If the machine pulls to the left adjust RH control linkage CW to slow right wheel. Readjust neutral if necessary.
FREE WHEEL OPERATION
To move machine without running the engine, rotate both dump valve levers located at the LH side of the pumps CCW 1/2 turn to "freewheel" positions. Return levers to original position to operate the mower.
HYDRAULIC FLUID LEVEL
Check hydraulic fluid level while fluid is cool. Fluid level should be 3" below top of filler neck. Fill with SAE 20W50 motor oil only.
IMPORTANT
Do not overfill. Room for hot fluid expansion must be allowed or resulting expansion may cause leaks in the system.
482550

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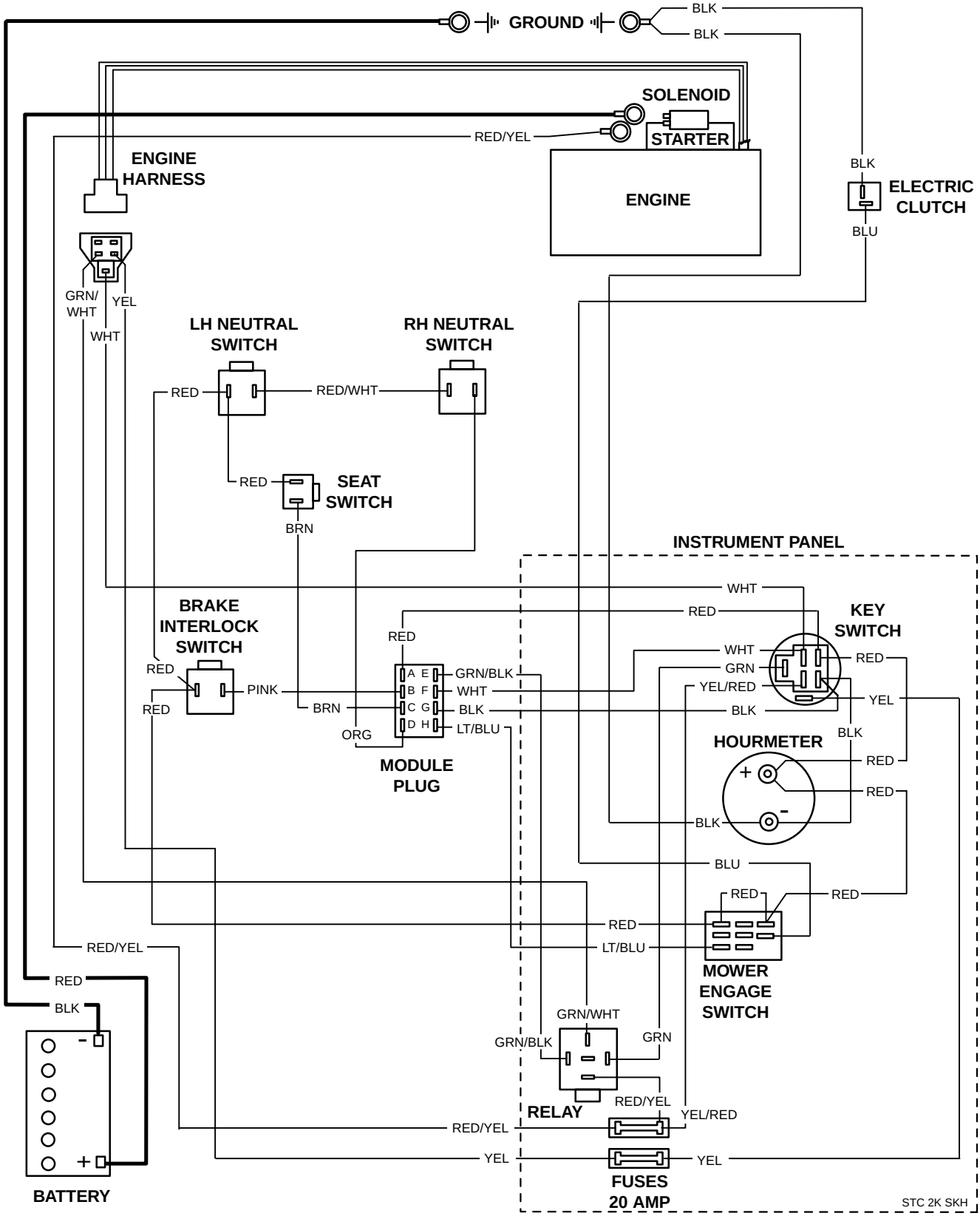
STC 2002 RDP2

ELECTRICAL SCHEMATIC - KAWASAKI & KOHLER



LIMITED WARRANTY - COMMERCIAL EQUIPMENT

Any part of the Scag commercial mower manufactured by Scag Power Equipment and found, in the reasonable judgment of Scag, to be defective in materials or workmanship, will be repaired or replaced by an Authorized Scag Service Dealer without charge for parts and labor. This warranty is limited to the original purchaser and is not transferable. Proof of purchase will be required by the dealer to substantiate any warranty claims. All warranty work must be performed by an Authorized Scag Service Dealer.

This warranty is limited to the following specified periods from the date of the original retail purchase for defects in materials or workmanship:

* Wear items including drive belts, blades, hydraulic hoses and tires are warranted for ninety (90) days.
* Batteries are covered for ninety (90) days.
* Frame and structural components including oil reservoir, fittings, and oil coolers are warranted for 2 years (Parts and labor 1st year; Parts only 2nd year).
* Cutter decks are warranted against cracking for a period of three (3) years. (Parts and labor 1st year; Parts only 2nd and 3rd year) The repair or replacement of the cutter deck will be at the option of Scag Power Equipment. We reserve the right to request components for evaluation. This warranty does not cover any mower that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual.
* Engines and electric starters are covered by the engine manufacturer's warranty period.
* Major drive system components are warranted for two (2) years by Scag Power Equipment. (Parts and labor 1st year; Parts only 2nd year) (Two year warranty exclude fittings, hoses, drive belts). The repair or replacement of the hydraulic pump or hydraulic motor will be at the option of Scag Power Equipment. This warranty does not cover any mower that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual.
* Electric clutches have a Limited Warranty for 2 year (Parts and labor 1st year; Parts only 2nd year).
* Cutter Spindle Assemblies 46631 have a Limited Warranty for three years (Parts and labor 1st year; Parts only 2nd and 3rd year).
* Any Scag product used for rental purposes is covered by a 90 day warranty.

The Scag mower, including any defective part must be returned to an Authorized Scag Service Dealer within the warranty period. The expense of delivering the mower to the dealer for warranty work and the expense of returning it to the owner after repair will be paid for by the owner. Scag's responsibility is limited to making the required repairs and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Scag mower.

This warranty does not cover any mower that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual. The warranty does not apply to any damage to the mower that is the result of improper maintenance, or to any mower or parts that have not been assembled or installed as specified in the Operator's Manual and Assembly Manual. The warranty does not cover any mower that has been altered or modified, changing performance or durability. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which, in the reasonable judgment of Scag, are either incompatible with the Scag mower or adversely affect its operation, performance or durability.

Scag Power Equipment reserves the right to change or improve the design of any mower without assuming any obligation to modify any mower previously manufactured. All other implied warranties are limited in duration to the two (2) year warranty period or ninety (90) days for mowers used for rental purpose. Accordingly, any such implied warranties including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the appropriate two year or ninety day warranty period. Scag's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective parts and Scag does not assume or authorize anyone to assume for them any other obligation. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Scag assumes no responsibility for incidental, consequential or other damages including, but not limited to, expense for gasoline, expense of delivering the mower to an Authorized Scag Service Dealer and expense of returning it to the owner, mechanic's travel time, telephone or telegram charges, rental of a like product during the time warranty repairs are being performed, travel, loss or damage to personal property, loss of revenue, loss of use of the mower, loss of time or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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